

**Set Name Query**

side by side

**Hit Count Set Name**

result set

*DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ*

<u>L24</u>	L3 and l20	3	<u>L24</u>
<u>L23</u>	L22 not l21	3	<u>L23</u>
<u>L22</u>	L2 and l20	6	<u>L22</u>
<u>L21</u>	l4 and L20	3	<u>L21</u>
<u>L20</u>	(504/206 OR 504/127 OR 504/128).CCLS.	439	<u>L20</u>
<u>L19</u>	L18 not l16	3	<u>L19</u>
<u>L18</u>	l13 and L17	4	<u>L18</u>
<u>L17</u>	amine same l5	34045	<u>L17</u>
<u>L16</u>	l13 and L15	1	<u>L16</u>
<u>L15</u>	l5 same L14	53	<u>L15</u>
<u>L14</u>	alkyletheramine\$1 or etheramine\$1 or alkyletherammonium or etherammonium	280	<u>L14</u>
<u>L13</u>	L1 and l2	50	<u>L13</u>
<u>L12</u>	l4 and l1	4	<u>L12</u>
<u>L11</u>	L10 not l7	4	<u>L11</u>
<u>L10</u>	l1 and L9	5	<u>L10</u>
<u>L9</u>	l5 same L8	2647	<u>L9</u>
<u>L8</u>	l2 or l3	316172	<u>L8</u>
<u>L7</u>	l1 and L6	1	<u>L7</u>
<u>L6</u>	l4 same L5	164	<u>L6</u>
<u>L5</u>	surfactant\$1 or (surface active)	325463	<u>L5</u>
<u>L4</u>	l2 same L3	952	<u>L4</u>
<u>L3</u>	lyotrop\$6	1288	<u>L3</u>
<u>L2</u>	liquid crystal\$8	315894	<u>L2</u>
<u>L1</u>	glyphosate OR (roundup or spator or muster or glifonox or glycel) OR (phosphonomethylglycine or ((phosphonomethyl or (phosphono methyl)) glycine) )	6061	<u>L1</u>

END OF SEARCH HISTORY

**WEST**[Generate Collection](#)[Print](#)

Search Results - Record(s) 1 through 1 of 1 returned.

☐ 1. Document ID: US 20030104943 A1

L7: Entry 1 of 1

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

US-CL-CURRENT: 504/206

Full	Title	CIT.1	REV.1	CLS.1	REF.1	SEQ.1	ATT.1
NAW.1							

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Terms	Documents
11 and L6	1

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**Search Results - Record(s) 1 through 4 of 4 returned.**☐ 1. Document ID: US 5719102 A

L11: Entry 1 of 4

File: USPT

Feb 17, 1998

US-PAT-NO: 5719102

DOCUMENT-IDENTIFIER: US 5719102 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Method for reducing odor from a herbicidal mixture

DATE-ISSUED: February 17, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gednalske; Joe V.	River Falls	WI		
Herzfeld; Robert W.	Stillwater	MN		

US-CL-CURRENT: 504/363; 504/206, 504/258

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC
Draw Desc	Image										

☐ 2. Document ID: US 5463180 A

L11: Entry 2 of 4

File: USPT

Oct 31, 1995

US-PAT-NO: 5463180

DOCUMENT-IDENTIFIER: US 5463180 A

TITLE: 2,4-dicholorophenoxy acetic acid reduced odor herbicidal mixture

DATE-ISSUED: October 31, 1995

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gednalske; Joe V.	Riverfalls	WI		
Herzfeld; Robert W.	Stillwater	MN		

US-CL-CURRENT: 504/323; 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 3. Document ID: US 5260260 A

L11: Entry 3 of 4

File: USPT

Nov 9, 1993

US-PAT-NO: 5260260

DOCUMENT-IDENTIFIER: US 5260260 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Nonionic herbicidal and surfactant blend

DATE-ISSUED: November 9, 1993

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gednalske, Joe V.	Apple Valley	MN		
Herzfeld, Robert W.	Stillwater	MN		

US-CL-CURRENT: 504/206; 504/214, 504/215, 504/234, 504/253, 504/310, 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWMC
Draw Desc	Image									

☐ 4. Document ID: WO 200189302 A2 AU 200163361 A US 20020123430 A1

L11: Entry 4 of 4

File: DWPI

Nov 29, 2001

DERWENT-ACC-NO: 2002-154464

DERWENT-WEEK: 200323

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TITLE: New surfactants and herbicide and pesticide compositions, comprising surfactant and glyphosic acid salt, for application to plant foliage

INVENTOR: ABRAHAM, W; BRINKER, R J ; GRAHAM, J A ; REYNOLDS, T L ; XU, X C ; AGBAJE, H E ; ARHANCET, G B ; BECHER, D Z ; CHEN, X ; GILLESPIE, J L ; GLAENZER, J L ; HENKE, S L ; LENNON, P J ; MAHONEY, M D ; PALLAS, N R ; WIDEMAN, A S ; WRIGHT, D L

PRIORITY-DATA: 2001US-274368P (March 8, 2001), 2000US-205524P (May 19, 2000), 2000US-206628P (May 24, 2000), 2001US-273234P (March 2, 2001), 2001US-0926521 (November 14, 2001), 2001US-0988353 (November 19, 2001)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200189302 A2	November 29, 2001	E	363	A01N057/20
AU 200163361 A	December 3, 2001		000	A01N057/20
US 20020123430 A1	September 5, 2002		000	A01N057/18

INT-CL (IPC): A01 N 25/04; A01 N 25/16; A01 N 25/30; A01 N 57/18; A01 N 57/20; C11 D 1/44; C11 D 1/62

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWMC
Draw Desc	Clip Img	Image								

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**WEST**

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Print

L11: Entry 1 of 4

File: USPT

Feb 17, 1998

DOCUMENT-IDENTIFIER: US 5719102 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Method for reducing odor from a herbicidal mixture

Brief Summary Text (7):

Surfactants interact with herbicides in a number of ways both before and after application to a crop. In addition to having use as an emulsifier, a surfactant may act as a penetrant, spreader, sticker, stabilizer, wetting agent, dispersant and defoamer. The surfactant may affect a rate of drying of a droplet on a plant and the nature of a residue, liquid or crystal. The surfactant may influence the weathering characteristics of the herbicide, including rewetting characteristics.

Brief Summary Text (33):

The nonionic surfactant blend of the present invention is compatible with a wide variety of compatible herbicides that include nicosulfuron DF manufactured by DuPont and has the chemical name

2(((4,6-Dimethoxypyrimidin-2-yl)aminocarbonyl)aminosulfonyl)-N,N-dimethyl-3-pyridinecarboxamide; primisulfuron made by Ciba-Geigy having chemical name 3-[4,6-Bis-(difluoromethoxy)-pyrimidin-2-yl]-1-(2-methoxycarbonylphenylsulfonyl)urea; clethodim; fluazifop having chemical name 2-[4[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoic acid; quizalofop; sethoxydim having chemical name 2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one; imazethapyr having chemical name 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazole-2-yl]-3-pyridinecarboxylic acid; fomesafen; acifluorfen having chemical name 5-[2-chloro-4-(trifluoromethyl)-phenoxy]-2-nitrobenzoic acid; laptufen; bentazon having chemical name 3-isopropyl-1H-2,1,3-benzothiadiazin-4-(3H)-1,2,2-dioxide; trifensulfuron having chemical name methyl 3-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]-2-thiophenecarboxylate; chlorimuron made by DuPont and having chemical name 2-[[[4-chloro-6-methoxypyrimidin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate; imazaquine; paraquat having chemical name 1,1'-dimethyl-4,4'-bipyridinium; glyphosate having chemical name N-(phosphonomethyl)glycine; tribenuron; chlorsulfuron having chemical name 3-(2-chloro-9H-thioxanthen-9-ylidene)-N,N-dimethyl-1-propanamine, metsulfuron, 2,4-dichlorophenoxy acetic acid, fluazifop-P-butyl, and sulfosate.

**WEST****End of Result Set**

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L11: Entry 4 of 4

File: DWPI

Nov. 29, 2001

DERWENT-ACC-NO: 2002-154464

DERWENT-WEEK: 200323

COPYRIGHT 2003 DERWENT INFORMATION LTD

TITLE: New surfactants and herbicide and pesticide compositions, comprising surfactant and glyphosic acid salt, for application to plant foliage

INVENTOR: ABRAHAM, W; BRINKER, R J ; GRAHAM, J A ; REYNOLDS, T L ; XU, X C ; AGBAJE, H E ; ARHANCET, G B ; BECHER, D Z ; CHEN, X ; GILLESPIE, J L ; GLAENZER, J L ; HENKE, S L ; LENNON, P J ; MAHONEY, M D ; PALLAS, N R ; WIDEMAN, A S ; WRIGHT, D L

PATENT-ASSIGNEE: MONSANTO TECHNOLOGY LLC (MONS)

PRIORITY-DATA: 2001US-274368P (March 8, 2001), 2000US-205524P (May 19, 2000), 2000US-206628P (May 24, 2000), 2001US-273234P (March 2, 2001), 2001US-0926521 (November 14, 2001), 2001US-0988353 (November 19, 2001)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200189302 A2	November 29, 2001	E	363	A01N057/20
AU 200163361 A	December 3, 2001		000	A01N057/20
US 20020123430 A1	September 5, 2002		000	A01N057/18

DESIGNATED-STATES: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CO CR CU CZ DE DK DM EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

## APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
WO. 200189302A2	May 21, 2001	2001WO-US16550	
AU 200163361A	May 21, 2001	2001AU-0063361	
AU 200163361A		WO 200189302	Based on
US20020123430A1	May 19, 2000	2000US-205524P	Provisional
US20020123430A1	May 24, 2000	2000US-206628P	Provisional
US20020123430A1	March 2, 2001	2001US-273234P	Provisional
US20020123430A1	March 8, 2001	2001US-274368P	Provisional
US20020123430A1	May 21, 2001	2001WO-US16550	CIP of
US20020123430A1	November 14, 2001	2001US-0926521	CIP of
US20020123430A1	November 19, 2001	2001US-0988353	

INT-CL (IPC): A01 N 25/04; A01 N 25/16; A01 N 25/30; A01 N 57/18; A01 N 57/20; C11 D 1/44; C11 D 1/62

RELATED-ACC-NO: 2002-759805;2003-183954 ;2003-239087

ABSTRACTED-PUB-NO: US20020123430A

BASIC-ABSTRACT:

NOVELTY - Formulation for retarding growth of vegetation comprises an aqueous mixture containing surfactant and glyphosate or its salt or ester. On application of the formulation to a plant, liquid crystals comprising the surfactant form in or on the foliage of the plant.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) storage stable herbicidal concentrates that can be diluted with water to form an aqueous herbicidal mixture for application to plant foliage, comprising glyphosate and a surfactant, such that when applied, anisotropic aggregates comprising the surfactant form on foliage or in cuticles;

(2) formulations for retarding growth of vegetation comprising an aqueous mixture containing glyphosate and surfactant that forms anisotropic aggregates within the cuticles of plant foliage;

(3) a surfactant of formula (I)-(XVIII);

(4) a pesticidal composition comprising at least 1 pesticide and at least 1 surfactant (I)-(XVIII);

R1 = H or hydrocarbyl of at least 7C;

R2 = 2-4C alkylene;

R3 = 2-6C optionally substituted hydrocarbylene;

R4, R5 = H, -(R6)<sub>n</sub>-(R20)<sub>7</sub>-R7 or optionally substituted 1-30C hydrocarbyl; or

NR4R5 = heterocyclic ring;

R6 = 1-6C optionally substituted hydrocarbylene;

R7 = H or 1-4C alkyl;

n = 0-1;

x, y = 1-60;

provided that when R2 and R3 = ethylene, R1 is not unsubstituted alkyl or R4 is not H or unsubstituted alkyl when R5 = H or unsubstituted alkyl; and when R2 and R3 = i-Pr and x = 1, R1 is not unsubstituted alkyl or R4 is not -(R20)<sub>y</sub>R7;

R11, R13 = H or optionally substituted 1-30C hydrocarbyl;

R12 = 2-4C alkylene;

R14 = 1-30C optionally substituted hydrocarbylene;

R15 = hydroxyalkyl, polyhydroxyalkyl or poly(hydroxyalkyl)alkyl;

xa = 0-30;

ya = 0-1;

R21, R23 = H or 1-22C optionally substituted hydrocarbyl;

R22 = 2-18C optionally substituted hydrocarbylene;

R24, R25 = hydroxyalkyl, polyhydroxyalkyl or poly(hydroxyalkyl)alkyl;

provided that when R21 and R23 = Me, R22 is not octylene;

R31 = optionally substituted 1-30C hydrocarbyl;

R32-R35 = H, -(R38)s-(R37O)naR36 or optionally substituted 1-30C hydrocarbyl;

R36 = H or 1-4C alkyl;

R37 = 2-4C alkylene;

R38 = 1-6C optionally substituted hydrocarbylene;

na = 1-10;

xb, yb = 1-4;

s = 0-1;

provided that when R31 = alkyl, R32 is not H, xb = 3-4, or R34 is not -(R37O)naR36;

R41 = optionally substituted 1-30C hydrocarbyl;

R42 = 2-4C alkylene;

R43 = H or 1-4C alkyl;

R44 = 1-30C alkynyl, aryl, or aralkyl;

xc = 1-60;

R51 = optionally substituted 8-30C hydrocarbyl;

R52, R53 = -(R54O)xdR55;

R54 = 2-4C alkylene;

R55 = H or optionally substituted 1-30C hydrocarbyl;

xd = 1-50;

R61 = H or optionally substituted 1-30C hydrocarbyl;

R62 = 2-4C alkylene;

R63 = 2-6C optionally substituted hydrocarbylene;

R64, R65 = H, -(R66)nb-(R62O)yeR67 or optionally substituted 1-30C hydrocarbyl;

R66 = optionally substituted 1-6C hydrocarbylene;

R67 = H or 1-4C alkyl;

ny = 0-1;

xe, ye = 1-60;

R71 = optionally substituted 8-30C hydrocarbyl;

R72 = 2-4C alkylene;

R73, R75, R76 = H, -(R72O)yfR77 or optionally substituted 1-30C hydrocarbyl;

R74 = optionally substituted 2-6C hydrocarbylene, -C(=NR1a)NR1bR1c-, C(O)NR1bR1c-, C(S)NR1bR1c-, -C(=NR1b-, -C(S)- or -C(O)-;

R77 = H or 1-4C alkyl;



R1a, R1b, Rc = H or optionally substituted 1-30C hydrocarbyl;

xf = 1-30;

Yf = 1-50;

provided that at least 1 R73, R75 or R76 = -(R72O)yfR77, at least 1 R72 is not ethylene, R74 is not unsubstituted propylene, R71 is not unsubstituted alkyl, or xf is 2-30;

R81 = optionally substituted 6-30C hydrocarbyl or R4SR5;

R82, R84 = 2-4C alkylene;

R83 = H or 1-4C alkyl;

R85 = 4-15C alkyl;

xg, yg = 1-40;

R91 = H or 1-4C alkyl;

R92 = 2-4C alkylene;

R93 = optionally substituted 2-30C hydrocarbyl;

xh, yh = 1-60;

R101, R109, R112 = optionally substituted 1-30C hydrocarbyl or -(R102O)p'R113;

R102 = 2-4C alkylene;

R103, R108, R111, R113, R115 = H or optionally substituted 1-30C hydrocarbyl;

R104 = -(CH2)yiOR113 or -(CH2)yiO(R102)q'R103;

R105-R107 = H, R104 or optionally substituted 1-30C hydrocarbyl;

R100 = optionally substituted 2-30C hydrocarbyl;

R114 = optionally substituted 1-30C hydrocarbyl or -(CH2)zO(R102)p'R103;

m', n', p', q' = 1-50;

X = O, NR114, C(O), C(O)O, OC(O), N(R115)C(O), C(O)N(R115), S, SO or SO2;

t' = 0-1;

A- = anion; and

yi, z = 0-30.

ACTIVITY - Herbicide; Pesticide; Plant Growth Regulant.

MECHANISM OF ACTION - None given.

USE - As herbicides (preferably as a growth regulant of e.g. Velvetleaf) and pesticides.

ABSTRACTED-PUB-NO: WO 200189302A

EQUIVALENT-ABSTRACTS:

NOVELTY - Formulation for retarding growth of vegetation comprises an aqueous mixture containing surfactant and glyphosate or its salt or ester. On application of

the formulation to a plant, liquid crystals comprising the surfactant form in or on the foliage of the plant.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) storage stable herbicidal concentrates that can be diluted with water to form an aqueous herbicidal mixture for application to plant foliage, comprising glyphosate and a surfactant, such that when applied, anisotropic aggregates comprising the surfactant form on foliage or in cuticles;

(2) formulations for retarding growth of vegetation comprising an aqueous mixture containing glyphosate and surfactant that forms anisotropic aggregates within the cuticles of plant foliage;

(3) a surfactant of formula (I)-(XVIII);

(4) a pesticidal composition comprising at least 1 pesticide and at least 1 surfactant (I)-(XVIII);

R1 = H or hydrocarbyl of at least 7C;

R2 = 2-4C alkylene;

R3 = 2-6C optionally substituted hydrocarbylene;

R4, R5 = H, -(R6)<sub>n</sub>-(R20)<sup>7</sup>-R7 or optionally substituted 1-30C hydrocarbyl; or

NR4R5 = heterocyclic ring;

R6 = 1-6C optionally substituted hydrocarbylene;

R7 = H or 1-4C alkyl;

n = 0-1;

x, y = 1-60;

provided that when R2 and R3 = ethylene, R1 is not unsubstituted alkyl or R4 is not H or unsubstituted alkyl when R5 = H or unsubstituted alkyl; and when R2 and R3 = i-Pr and x = 1, R1 is not unsubstituted alkyl or R4 is not -(R20)<sup>y</sup>R7;

R11, R13 = H or optionally substituted 1-30C hydrocarbyl;

R12 = 2-4C alkylene;

R14 = 1-30C optionally substituted hydrocarbylene;

R15 = hydroxyalkyl, polyhydroxyalkyl or poly(hydroxyalkyl)alkyl;

xa = 0-30;

ya = 0-1;

R21, R23 = H or 1-22C optionally substituted hydrocarbyl;

R22 = 2-18C optionally substituted hydrocarbylene;

R24, R25 = hydroxyalkyl, polyhydroxyalkyl or poly(hydroxyalkyl)alkyl;

provided that when R21 and R23 = Me, R22 is not octylene;

R31 = optionally substituted 1-30C hydrocarbyl;

R32-R35 = H, -(R38)<sub>s</sub>-(R370)<sub>na</sub>R36 or optionally substituted 1-30C hydrocarbyl;

R36 = H or 1-4C alkyl;

R37 = 2-4C alkylene;

R38 = 1-6C optionally substituted hydrocarbylene;

na = 1-10;

xb, yb = 1-4;

s = 0-1;

provided that when R31 = alkyl, R32 is not H, xb = 3-4, or R34 is not -(R370)naR36;

R41 = optionally substituted 1-30C hydrocarbyl;

R42 = 2-4C alkylene;

R43 = H or 1-4C alkyl;

R44 = 1-30C alkynyl, aryl, or aralkyl;

xc = 1-60;

R51 = optionally substituted 8-30C hydrocarbyl;

R52, R53 = -(R540)xdR55;

R54 = 2-4C alkylene;

R55 = H or optionally substituted 1-30C hydrocarbyl;

xd = 1-50;

R61 = H or optionally substituted 1-30C hydrocarbyl;

R62 = 2-4C alkylene;

R63 = 2-6C optionally substituted hydrocarbylene;

R64, R65 = H, -(R66)nb-(R620)yeR67 or optionally substituted 1-30C hydrocarbyl;

R66 = optionally substituted 1-6C hydrocarbylene;

R67 = H or 1-4C alkyl;

ny = 0-1;

xe, ye = 1-60;

R71 = optionally substituted 8-30C hydrocarbyl;

R72 = 2-4C alkylene;

R73, R75, R76 = H, -(R720)yfR77 or optionally substituted 1-30C hydrocarbyl;

R74 = optionally substituted 2-6C hydrocarbylene, -C(=NR1a)NR1bR1c-, C(O)NR1bR1c-, C(S)NR1bR1c-, -C(=NR1b-, -C(S)- or -C(O)-;

R77 = H or 1-4C alkyl;

R1a, R1b, R1c = H or optionally substituted 1-30C hydrocarbyl;

xf = 1-30;

Yf = 1-50;

provided that at least 1 R73, R75 or R76 = -(R72O)yfR77, at least 1 R72 is not ethylene, R74 is not unsubstituted propylene, R71 is not unsubstituted alkyl, or xf is 2-30;

R81 = optionally substituted 6-30C hydrocarbyl or R4SR5;

R82, R84 = 2-4C alkylene;

R83 = H or 1-4C alkyl;

R85 = 4-15C alkyl;

xg, yg = 1-40;

R91 = H or 1-4C alkyl;

R92 = 2-4C alkylene;

R93 = optionally substituted 2-30C hydrocarbyl;

xh, yh = 1-60;

R101, R109, R112 = optionally substituted 1-30C hydrocarbyl or -(R102O)p'R113;

R102 = 2-4C alkylene;

R103, R108, R111, R113, R115 = H or optionally substituted 1-30C hydrocarbyl;

R104 = -(CH2)yiOR113 or -(CH2)yiO(R102)q'R103;

R105-R107 = H, R104 or optionally substituted 1-30C hydrocarbyl;

R100 = optionally substituted 2-30C hydrocarbyl;

R114 = optionally substituted 1-30C hydrocarbyl or -(CH2)zO(R102)p'R103;

m', n', p', q' = 1-50;

X = O, NR114, C(O), C(O)O, OC(O), N(R115)C(O), C(O)N(R115), S, SO or SO2;

t' = 0-1;

A- = anion; and

yi, z = 0-30.

ACTIVITY - Herbicide; Pesticide; Plant Growth Regulant.

MECHANISM OF ACTION - None given.

USE - As herbicides (preferably as a growth regulant of e.g. Velvetleaf) and pesticides.

CHOSEN-DRAWING: Dwg.0/4

DERWENT-CLASS: A97 C01

CPI-CODES: A12-W04C; C04-C03C; C10-A15; C10-A18; C10-A21; C10-A22; C10-B01; C10-B04B; C14-B01; C14-U01; C14-V01;

**WEST**

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**Search Results - Record(s) 1 through 4 of 4 returned.**☐ 1. Document ID: US 20030104943 A1

L12: Entry 1 of 4

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMIC

☐ 2. Document ID: US 6475953 B1

L12: Entry 2 of 4

File: USPT

Nov 5, 2002

US-PAT-NO: 6475953

DOCUMENT-IDENTIFIER: US 6475953 B1

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: November 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMC

☐ 3. Document ID: US 6407042 B1

L12: Entry 3 of 4

File: USPT

Jun 18, 2002

US-PAT-NO: 6407042

DOCUMENT-IDENTIFIER: US 6407042 B1

TITLE: Assay for selecting compositions providing enhanced effectiveness of exogenous chemicals applied to plants

DATE-ISSUED: June 18, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/358; 356/365, 436/166, 514/772

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMC

☒ 4. Document ID: US 6093681 A

L12: Entry 4 of 4

File: USPT

Jul 25, 2000

US-PAT-NO: 6093681

DOCUMENT-IDENTIFIER: US 6093681 A

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: July 25, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/365, 504/206, 504/235, 504/250, 514/561, 514/563, 514/772

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L12: Entry 4 of 4

File: USPT

Jul 25, 2000

DOCUMENT-IDENTIFIER: US 6093681 A

TITLE: Composition and method for treating plants with exogenous chemicals

Brief Summary Text (3):

Exogenous chemicals, including foliar-applied herbicides, have at times been formulated with surfactants, so that when water is added, the resulting sprayable composition is more easily and effectively retained on the foliage (e.g., the leaves or other photosynthesizing organs) of plants. Surfactants can also bring other benefits, including improved contact of spray droplets with a waxy leaf surface and, in some cases, improved penetration of the accompanying exogenous chemical into the interior of leaves. Through these and perhaps other effects, surfactants have long been known to increase the biological effectiveness of herbicide compositions, or other compositions of exogenous chemicals, when added to or included in such compositions. Thus, for example, the herbicide glyphosate (N-phosphonomethylglycine) has been formulated with surfactants such as polyoxyalkylene-type surfactants including, among other surfactants, polyoxyalkylene alkylamines. Commercial formulations of glyphosate herbicide marketed under the trademark ROUNDUP.RTM. have been formulated with a surfactant composition based on such a polyoxyalkylene alkylamine, in particular a polyethoxylated tallowamine, this surfactant composition being identified as MON 0818. Surfactants have generally been combined with glyphosate or other exogenous chemicals either in a commercial concentrate (herein referred to as a "coformulation"), or in a diluted mixture that is prepared from separate compositions, one comprising an exogenous chemical (e.g. glyphosate) and another comprising surfactant, prior to use in the field (i.e., a tank mix).

Brief Summary Text (6):

Other surfactants, though chemically stable, are physically incompatible with certain exogenous chemicals, particularly in concentrate coformulations. For example, most classes of nonionic surfactant, including polyoxyethylene alkylether surfactants, do not tolerate solutions of high ionic strength, as for example in a concentrated aqueous solution of a salt of glyphosate. Physical incompatibility can also lead to inadequate shelf-life. Other problems that can arise from such incompatibility include the formation of aggregates large enough to interfere with commercial handling and application, for example by

Brief Summary Text (22):

Another preferred subclass of exogenous chemicals is those that exhibit systemic biological activity in the plant. Within this subclass, an especially preferred group of exogenous chemicals is N-phosphonomethylglycine and its herbicidal derivatives. N-phosphonomethylglycine, often referred to by its common name glyphosate, can be used in its acid form, but is more preferably used in the form of a salt. Any water-soluble salt of glyphosate can be used in the practice of this invention. Some preferred salts include the sodium, potassium, ammonium, mono-, di-, tri- and tetra-C.sub.1-4 -alkylammonium, mono-, di- and tri-C.sub.1-4 -alkanolammonium, mono-, di- and tri-C.sub.1-4 -alkylsulfonium and sulfoxonium salts. The ammonium, monoisopropylammonium and trimethylsulfonium salts of glyphosate are especially preferred. Mixtures of salts can also be useful in certain situations.

Brief Summary Text (34):

The weight ratio of the first excipient substance to the exogenous chemical is



between about 1:3 and about 11:100. We have been surprised by the high level of biological effectiveness, specifically herbicidal effectiveness of a glyphosate composition, exhibited at such low ratios of excipient substance to exogenous chemical. Higher ratios can also be effective but are likely to be uneconomic in most situations and increase the risk of

Brief Summary Text (63):

Without being bound by theory, it is believed that that the method and compositions of the present invention create or enlarge hydrophilic channels through the epicuticular wax of the plant cuticle, these channels being capable of accommodating the mass transfer of a water-soluble exogenous chemical into the plant, and thus transporting the exogenous chemical into the plant more rapidly or more completely than an epicuticular wax layer lacking such formation or enlargement of hydrophilic channels. Of course, certain compositions of the present invention can also enter a plant through stomata, but this generally requires a very low surface tension which is not an essential feature of the present compositions. The enhanced cuticular penetration believed to be achieved by the compositions of the present invention enhances the overall delivery and effectiveness of the exogenous chemical. Whereas an exogenous chemical such as glyphosate, formulated as an aqueous solution or dispersion with surfactants which do not have the property of forming anisotropic aggregates in or on a wax layer, normally penetrates through the epicuticular wax very slowly (e.g., in 1-4 days), a substantial portion of the exogenous chemical in compositions of the present invention penetrates much more quickly (e.g., in from about 10 minutes to a few hours, preferably in less than about 30 minutes).

Brief Summary Text (66):

Again without being bound by theory, it is believed that when the composition is present on the leaf of a plant as a droplet of aqueous solution or dispersion, in an aqueous microdomain on the cuticular surface (i.e., the aqueous region at the interface between the water droplet and the epicuticular wax), the majority (i.e., more than 50% by weight) of the aggregate-forming substance is present in a form other than a monolayer, for example as a bilayer or multilamellar (liquid crystal) structure. The aggregate-forming substances employed have several preferred characteristics that are believed to contribute to the formation of transcuticular hydrophilic channels. For instance, they have a tendency to form extended self-assembled structures in the presence of water and the kinds of waxes encountered in cuticles. Generally, materials that form non-simple (i.e., not small spherical micellar structures) aggregates in solution, such as vesicles or cylindrical, discotic, or ribbon-like micellar structures are preferred. These tend to form more complex adsorbed and absorbed layers with hydrophobic substrates than those simple micellar systems that tend to produce simple adsorbed monolayers. These substances also tend to produce lyotropic mesophases such as lamellar, hexagonal or reversed hexagonal phases in the compositions established in the aqueous microdomains in or on the cuticle.

Brief Summary Text (73):

Another embodiment of the present invention is a herbicidal method which can be used in a field that contains both weed and crop plants, where the crop plants are resistant to the effects of a particular herbicide at the rate that herbicide is used. The method comprises contacting the foliage of both the weeds and the crops in the field with a composition as described above. The composition will have a herbicidal effect on the weeds (i.e., it will partially or entirely kill the weeds) but it will not harm the crops. This herbicidal method applies to any combination of a selective post-emergence herbicide (e.g. 2,4-D) and a crop on which that herbicide can be used selectively to kill weeds (e.g., in the case of 2,4-D, wheat). This herbicidal method also applies to any combination of a normally non-selective post-emergence herbicide and a crop bred or genetically modified to be resistant to that herbicide. An example of a suitable combination of herbicide and herbicide-resistant crop is ROUNDUP.RTM. herbicide and ROUNDUP READY.RTM. crops, developed by Monsanto Company.

Brief Summary Text (74):

The compositions and methods of the present invention have a number of advantages. They provide enhanced biological activity of exogenous chemicals in or on plants in comparison with prior formulations, either in terms of greater ultimate biological

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 3 of 3 returned.**☐ 1. Document ID: US 6475953 B1

L19: Entry 1 of 3

File: USPT

Nov 5, 2002

US-PAT-NO: 6475953

DOCUMENT-IDENTIFIER: US 6475953 B1

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: November 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: [504/206](#); [504/358](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KIMC](#)☐ 2. Document ID: US 6407042 B1

L19: Entry 2 of 3

File: USPT

Jun 18, 2002

US-PAT-NO: 6407042

DOCUMENT-IDENTIFIER: US 6407042 B1

TITLE: Assay for selecting compositions providing enhanced effectiveness of exogenous chemicals applied to plants

DATE-ISSUED: June 18, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: [504/358](#); [356/365](#), [436/166](#), [514/772](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KIMC

☐ 3. Document ID: US 6093681 A

L19: Entry 3 of 3

File: USPT

Jul 25, 2000

US-PAT-NO: 6093681

DOCUMENT-IDENTIFIER: US 6093681 A

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: July 25, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Aftton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/365; 504/206, 504/235, 504/250, 514/561, 514/563, 514/772

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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**Search Results - Record(s) 1 through 3 of 3 returned.**☐ 1. Document ID: US 20030104943 A1

L21: Entry 1 of 3

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 2. Document ID: US 6475953 B1

L21: Entry 2 of 3

File: USPT

Nov 5, 2002

US-PAT-NO: 6475953

DOCUMENT-IDENTIFIER: US 6475953 B1

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: November 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Aftton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 3. Document ID: US 6093681 A

L21: Entry 3 of 3

File: USPT

Jul 25, 2000

US-PAT-NO: 6093681

DOCUMENT-IDENTIFIER: US 6093681 A

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: July 25, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Aftton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/365; 504/206, 504/235, 504/250, 514/561, 514/563, 514/772

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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**Search Results - Record(s) 1 through 3 of 3 returned.**☐ 1. Document ID: US 5719102 A

L23: Entry 1 of 3

File: USPT

Feb 17, 1998

US-PAT-NO: 5719102

DOCUMENT-IDENTIFIER: US 5719102 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Method for reducing odor from a herbicidal mixture

DATE-ISSUED: February 17, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gednalske; Joe V.	River Falls	WI		
Herzfeld; Robert W.	Stillwater	MN		

US-CL-CURRENT: 504/363; 504/206, 504/258

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 2. Document ID: US 5260260 A

L23: Entry 2 of 3

File: USPT

Nov 9, 1993

US-PAT-NO: 5260260

DOCUMENT-IDENTIFIER: US 5260260 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Nonionic herbicidal and surfactant blend

DATE-ISSUED: November 9, 1993

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gednalske; Joe V.	Apple Valley	MN		
Herzfeld; Robert W.	Stillwater	MN		

US-CL-CURRENT: 504/206; 504/214, 504/215, 504/234, 504/253, 504/310, 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 3. Document ID: US 5123951 A

L23: Entry 3 of 3

File: USPT

Jun 23, 1992

US-PAT-NO: 5123951

DOCUMENT-IDENTIFIER: US 5123951 A

TITLE: Synergistic plant growth regulator compositions

DATE-ISSUED: June 23, 1992

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
See; Raymond M.	Franklinton	NC		
Fritz; Charles D.	Raleigh	NC		
Manning; David T.	Cary	NC		
Wheeler; Thomas N.	Raleigh	NC		
Cooke; Anson R.	Durham	NC		

US-CL-CURRENT: 504/127, 504/126, 504/128, 504/129, 504/130, 504/133, 504/134,  
504/135, 504/136, 504/137, 504/138, 504/139, 504/140, 504/141, 504/144, 504/147,  
504/149

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L23: Entry 3 of 3

File: USPT

Jun 23, 1992

DOCUMENT-IDENTIFIER: US 5123951 A

TITLE: Synergistic plant growth regulator compositions

Detailed Description Text (276):

To a stirred mixture of 2.78 grams (0.02 mole) of mono-methyl methoxymalonate prepared in Example LVI (Compound 214) and 3.56 grams (0.02 mole) of 4-bromo-2-fluoroaniline in approximately 100 milliliters of dry tetrahydrofuran was fed dropwise a solution of 3.87 grams (0.02 mole) of 1,3-dicyclohexylcarbodiimide in about 30 milliliters of dry tetrahydrofuran, while cooling the reaction mixture in an ice-water bath. The reaction mixture was allowed to warm slowly to room temperature and stirring continued for an approximate 65-hour period. The precipitated 1,3-dicyclohexylurea by-product (3.15 grams) was removed by filtration and the filtrate vacuum evaporated and the residue dissolved in methylene chloride. The latter solution was extracted with dilute HCl and then water, then dried (MgSO<sub>4</sub>.sub.4) and solvent vacuum evaporated to give a colorless liquid. Flash column chromatography of the latter on silica, eluting with hexane-ethyl acetate (7:3) gave, after workup, a liquid which crystallized on standing. Recrystallization from hexane containing a small amount of ethyl acetate gave 2.3 grams (0.01 mole) of methyl 3-[(4-bromo-2-fluorophenyl)amino]-2-methoxy-3-oxopropanoate having a melting point of 51.degree. C.-53.degree. C.

Current US Original Classification (1):

504/127

Current US Cross Reference Classification (2):

504/128



**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 3 of 3 returned.**☐ 1. Document ID: US 20030104943 A1

L24: Entry 1 of 3

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

US-CL-CURRENT: 504/206

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>
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[KIMC](#)☐ 2. Document ID: US 6475953 B1

L24: Entry 2 of 3

File: USPT

Nov 5, 2002

US-PAT-NO: 6475953

DOCUMENT-IDENTIFIER: US 6475953 B1

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: November 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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☐ 3. Document ID: US 6093681 A

L24: Entry 3 of 3

File: USPT

Jul 25, 2000

US-PAT-NO: 6093681

DOCUMENT-IDENTIFIER: US 6093681 A

TITLE: Composition and method for treating plants with exogenous chemicals

DATE-ISSUED: July 25, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; Anthony J. I.	Clayton	MO		
Ge; Jisheng	Affton	MO		
Gillespie; Jane L.	St. Louis	MO		
Sandbrink; Joseph J.	Des Peres	MO		
Xu; Xiaodong C.	St. Louis	MO		

US-CL-CURRENT: 504/365; 504/206, 504/235, 504/250, 514/561, 514/563, 514/772

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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result set

*DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ*

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side by side			result set
<u>L12</u>	18 and L11	26	<u>L12</u>
<u>L11</u>	19 or L10	55223	<u>L11</u>
<u>L10</u>	hooccooh	46	<u>L10</u>
<u>L9</u>	oxalic or ethanedioic	55218	<u>L9</u>
<u>L8</u>	11 and L7	347	<u>L8</u>
<u>L7</u>	12 same L6	8343	<u>L7</u>
<u>L6</u>	L5 near3 (amine\$1 or alkylamine\$1 or ammonium or alkylammonium)	29758	<u>L6</u>
<u>L5</u>	glycol or polyglycol or ethyleneglycol or 14	819227	<u>L5</u>
<u>L4</u>	alkoxy\$5 or ethoxy\$5 or propoxy\$5 or oxyalkyl\$5 or oxyethyl\$5 or oxypropyl\$5 or polyalkoxy\$5 or polyethoxy\$5 or polypropoxy\$5 or polyoxyalkyl\$5 or polyoxyethyl\$5 or polyoxypropyl\$5 or EO or po	577090	<u>L4</u>
<u>L3</u>	alkyletheramine\$1 or alkyletherammonium or (alkyl adj (etheramine\$1 or etherammonium))	46	<u>L3</u>
<u>L2</u>	surfactant\$1 or (surface active)	325262	<u>L2</u>
<u>L1</u>	glyphosate OR (roundup or spator or muster or glifonox or glycel) OR (phosphonomethylglycine or ((phosphonomethyl or (phosphono methyl)) glycine) )	6055	<u>L1</u>

END OF SEARCH HISTORY

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 10 of 26 returned.**☐ 1. Document ID: US 20030104945 A1

L12: Entry 1 of 26

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104945

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104945 A1

TITLE: 2,4-Diamino-1,3,5-triazines, their preparation, and their use as herbicides and plant growth regulators

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Giencke, Wolfgang	Hofheim		DE	
Willms, Lothar	Hofheim		DE	
Dietrich, Hansjorg	Hofheim		DE	
Auler, Thomas	Bad Soden		DE	
Bieringer, Hermann	Eppstein		DE	
Menne, Hubert	Hofheim		DE	

US-CL-CURRENT: [504/230](#); [504/231](#), [544/211](#), [544/212](#)

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>
<a href="#">Draw Desc</a>	<a href="#">Image</a>								

[KMC](#)☐ 2. Document ID: US 20030104943 A1

L12: Entry 2 of 26

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 3. Document ID: US 20030096708 A1

L12: Entry 3 of 26

File: PGPB

May 22, 2003

PGPUB-DOCUMENT-NUMBER: 20030096708  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030096708 A1

TITLE: Pesticide concentrates containing etheramine surfactants

PUBLICATION-DATE: May 22, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Agbaje, Henry E.	St. Louis	MO	US	
Becher, David Z.	St. Louis	MO	US	
Bates, Chris	Ballwin	MO	US	
Seifert-Higgins, Simone	Pacific	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	

US-CL-CURRENT: 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 4. Document ID: US 20030087764 A1

L12: Entry 4 of 26

File: PGPB

May 8, 2003

PGPUB-DOCUMENT-NUMBER: 20030087764  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030087764 A1

TITLE: Stable liquid pesticide compositions

PUBLICATION-DATE: May 8, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Pallas, Norman R.	Florissant	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Singh, Lata	Ellisville	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	

US-CL-CURRENT: 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 5. Document ID: US 20020160916 A1

L12: Entry 5 of 26

File: PGPB

Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160916  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020160916 A1

TITLE: Agricultural formulation

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Volgas, Greg	Bartlett	TN	US	
Roberts, Johnnie R.	Memphis	TN	US	
Hayes, Amanda	Memphis	TN	US	

US-CL-CURRENT: 504/194; 504/195, 504/196, 504/197, 504/198, 504/362, 504/363,  
504/364, 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 6. Document ID: US 20020123430 A1

L12: Entry 6 of 26

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 7. Document ID: US 20020115567 A1

L12: Entry 7 of 26

File: PGPB

Aug 22, 2002

PGPUB-DOCUMENT-NUMBER: 20020115567

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020115567 A1

TITLE: Substituted 2-amino-1,3,5-triazines, their preparation, and their use as herbicides and plant growth regulators

PUBLICATION-DATE: August 22, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Giencke, Wolfgang	Hofheim		DE	
Willms, Lothar	Hofheim		DE	
Auler, Thomas	Bad Soden		DE	
Bieringer, Hermann	Eppstein		DE	
Menne, Hubert	Hofheim		DE	

US-CL-CURRENT: 504/231; 544/194

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMC

☐ 8. Document ID: US 20020091260 A1

L12: Entry 8 of 26

File: PGPB

Jul 11, 2002

PGPUB-DOCUMENT-NUMBER: 20020091260

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020091260 A1

TITLE: 2,4-diamino-1,3,5-triazines, their preparation, and their use as herbicides and plant growth regulators

PUBLICATION-DATE: July 11, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Giencke, Wolfgang	Hofheim		DE	
Minn, Klemens	Hattersheim		DE	
Willms, Lothar	Hofheim		DE	
Auler, Thomas	Kelsterbach		DE	
Bieringer, Hermann	Eppstein		DE	
Rosinger, Christopher	Hofheim		DE	

US-CL-CURRENT: 544/197; 504/230, 504/231, 504/232, 544/206, 544/211

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 9. Document ID: US 20020058601 A1

L12: Entry 9 of 26

File: PGPB

May 16, 2002

PGPUB-DOCUMENT-NUMBER: 20020058601

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020058601 A1

TITLE: Compositions including ether-capped poly(oxyalkylated) alcohol wetting agents

PUBLICATION-DATE: May 16, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Jordan, Glenn Thomas IV	Indian Springs	OH	US	
Scheper, William Michael	Lawrenceburg	IN	US	
Sivik, Mark Robert	Mason	OH	US	
Kluesener, Bernard William	Harrison	OH	US	
McKenzie, Kristen Lynne	Mason	OH	US	

US-CL-CURRENT: 510/421; 510/505

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 10. Document ID: US 20020049140 A1

L12: Entry 10 of 26

File: PGPB

Apr 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020049140

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020049140 A1

TITLE: Solid glyphosate-formulation and manufacturing process

PUBLICATION-DATE: April 25, 2002

## INVENTOR-INFORMATION:



NAME	CITY	STATE	COUNTRY	RULE-47
Hamroll, Bernd	Magdeburg		DE	
Dittrich, Gunter	Magdeburg		DE	
Muller, Bernd	Magdeburg		DE	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	RMC
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**Display Format:** [Change Format](#)[Previous Page](#)[Next Page](#)

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 11 through 20 of 26 returned.**☐ 11. Document ID: US 20010011063 A1

L12: Entry 11 of 26

File: PGPB

Aug 2, 2001

PGPUB-DOCUMENT-NUMBER: 20010011063

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010011063 A1

TITLE: Substituted 2,4-diamino-1,3,5-triazines, processes for their preparation and their use as herbicides and plant growth regulators

PUBLICATION-DATE: August 2, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Giencke, Wolfgang	Hofheim		DE	
Willms, Lothar	Hofheim		DE	
Auler, Thomas	Bad Soden		DE	
Bieringer, Hermann	Eppstein		DE	
Rosinger, Christopher	Hofheim		DE	

US-CL-CURRENT: 504/231; 544/212

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 12. Document ID: US 6475954 B2

L12: Entry 12 of 26

File: USPT

Nov 5, 2002

US-PAT-NO: 6475954

DOCUMENT-IDENTIFIER: US 6475954 B2

TITLE: Solid glyphosphate-formulation and manufacturing process

DATE-ISSUED: November 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hamroll, Bernd	Magdeburg			DE
Dittrich, Gunter	Magdeburg			DE
Muller, Bernd	Magdeburg			DE

US-CL-CURRENT: 504/206; 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☒ 13. Document ID: US 6313074 B1

L12: Entry 13 of 26

File: USPT

Nov 6, 2001

US-PAT-NO: 6313074

DOCUMENT-IDENTIFIER: US 6313074 B1

TITLE: Effect enhancer for agricultural chemical

DATE-ISSUED: November 6, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Suzuki; Tadayuki	Wakayama			JP
Hayashi; Masaharu	Wakayama			JP
Kurita; Kazuhiko	Wakayama			JP
Hioki; Yuichi	Wakayama			JP

US-CL-CURRENT: 504/362; 514/772, 514/975

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 14. Document ID: US 6239071 B1

L12: Entry 14 of 26

File: USPT

May 29, 2001

US-PAT-NO: 6239071

DOCUMENT-IDENTIFIER: US 6239071 B1

TITLE: 2,4-diamino-1,3,5-triazines, processes for their preparation and their use as herbicides and plant growth regulators

DATE-ISSUED: May 29, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Giencke; Wolfgang	Hofheim			DE
Minn; Klemens	Hattersheim			DE
Willms; Lothar	Hofheim			DE
Bieringer; Hermann	Eppstein			DE
Bauer; Klaus	Hanau			DE
Rosinger; Christopher	Hofheim			DE

US-CL-CURRENT: 504/113; 504/234, 544/208, 544/209

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☒ 15. Document ID: US 6180566 B1

L12: Entry 15 of 26

File: USPT

Jan 30, 2001

US-PAT-NO: 6180566

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: January 30, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 16. Document ID: US 6121195 A

L12: Entry 16 of 26

File: USPT

Sep 19, 2000

US-PAT-NO: 6121195

DOCUMENT-IDENTIFIER: US 6121195 A

TITLE: Methods and compositions for enhancing formyltetrahydropteroylpolyglutamate in plants

DATE-ISSUED: September 19, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Nishio; John N.	Laramie	WY	82070	
Benson; Andrew A.	La Jolla	CA	92037	

US-CL-CURRENT: 504/136; 504/143, 504/144, 504/147, 504/149, 504/241, 504/318, 504/324, 504/339

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 17. Document ID: US 6071860 A

L12: Entry 17 of 26

File: USPT

Jun 6, 2000

US-PAT-NO: 6071860

DOCUMENT-IDENTIFIER: US 6071860 A

TITLE: 2,4-Diamino-1, 3,5-triazines, their preparation, and their use as herbicides

and plant growth regulators

DATE-ISSUED: June 6, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Giencke; Wolfgang	Hofheim			DE
Willms; Lothar	Hofheim			DE
Bauer; Klaus	Hanau			DE
Bieringer; Hermann	Eppstein			DE
Rosinger; Christopher	Hofheim			DE

US-CL-CURRENT: 504/232, 504/221, 504/222, 504/223, 504/225, 504/228, 504/233,  
504/234, 544/105, 544/113, 544/183, 544/206, 544/207, 544/48, 544/51, 544/52, 544/91

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☒ 18. Document ID: US 6071858 A

L12: Entry 18 of 26

File: USPT

Jun 6, 2000

US-PAT-NO: 6071858

DOCUMENT-IDENTIFIER: US 6071858 A

TITLE: Stable, dry compositions for use as herbicides

DATE-ISSUED: June 6, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Modrcin; Thomas F.	Liberty	MO		
Desai; Vijay C.	Shawnee	KS		
Newallis; Peter E.	Leawood	KS		
Jelich; Klaus	Overland Park	KS		
Brandriff; John W.	Blue Springs	MO		
Jackman; Dennis E.	Prairie Village	KS		

US-CL-CURRENT: 504/134

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 19. Document ID: US 6069114 A

L12: Entry 19 of 26

File: USPT

May 30, 2000

US-PAT-NO: 6069114

DOCUMENT-IDENTIFIER: US 6069114 A

TITLE: 2-amino-4-bicycloamino-1,3,5-Triazines, their preparation, and their use as herbicide and plant growth regulators

DATE-ISSUED: May 30, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lorenz; Klaus	Weiterstadt			DE
Minn; Klemens	Hattersheim			DE
Willms; Lothar	Hofheim			DE
Bauer; Klaus	Hanau			DE
Bieringer; Hermann	Eppstein			DE
Rosinger; Christopher	Hofheim			DE

US-CL-CURRENT: 504/232; 504/219, 504/220, 504/221, 504/223, 504/225, 504/228,  
504/229, 504/230, 504/233, 504/234, 540/455, 540/460, 540/468, 540/469, 540/473,  
540/481, 540/490, 540/501, 540/502, 540/503, 540/504, 540/523, 540/569, 540/594,  
540/598, 544/105, 544/11, 544/113, 544/183, 544/197, 544/198, 544/204, 544/205,  
544/206, 544/207, 544/208, 544/209, 544/48, 544/49, 544/5, 544/50, 544/51, 544/52,  
544/55, 544/58.5, 544/62, 544/65, 544/66, 544/67, 544/68, 544/83, 544/90, 544/91,  
544/92, 544/95, 544/96

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 20. Document ID: US 6020288 A

L12: Entry 20 of 26

File: USPT

Feb 1, 2000

US-PAT-NO: 6020288

DOCUMENT-IDENTIFIER: US 6020288 A

TITLE: Methods and compositions for enhancing cytochrome P450 in plants

DATE-ISSUED: February 1, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Benson; Andrew A.	La Jolla	CA	92037	
Nishio; John N.	Laramie	WY	82070-3917	

US-CL-CURRENT: 504/127; 504/128, 504/130, 504/136, 504/138, 504/140, 504/142,  
504/143, 504/144, 504/149

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L12: Entry 21 of 26

File: USPT

Jul 13, 1999

US-PAT-NO: 5922648

DOCUMENT-IDENTIFIER: US 5922648 A

TITLE: 2-amino-1,3,5-triazines, and their use as herbicides and plant growth regulators

DATE-ISSUED: July 13, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lorenz; Klaus	Weiterstadt			DE
Minn; Klemens	Hattersheim			DE
Willms; Lothar	Hofheim			DE
Bauer; Klaus	Hanau			DE
Bieringer; Hermann	Eppstein			DE
Rosinger; Christopher	Hofheim			DE

US-CL-CURRENT: 504/232; 504/219, 504/230, 504/233, 504/234, 540/481, 540/598,  
544/113, 544/206, 544/207

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RMC
Draw Desc	Image										

☐ 22. Document ID: US 5846908 A

L12: Entry 22 of 26

File: USPT

Dec 8, 1998

US-PAT-NO: 5846908

DOCUMENT-IDENTIFIER: US 5846908 A

TITLE: Methods and compositions for enhancing plant growth with p-amino- or p-nitro-benzoic acids

DATE-ISSUED: December 8, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Nishio; John N.	Laramie	WY	82070	
Benson; Andrew A.	La Jolla	CA	92037	

US-CL-CURRENT: 504/322; 504/136, 504/142, 504/144, 504/147, 504/149, 504/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC
Draw Desc	Image										

☒ 23. Document ID: US 5795847 A

L12: Entry 23 of 26

File: USPT

Aug 18, 1998

US-PAT-NO: 5795847

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: August 18, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KIMC
Draw Desc	Image									

☐ 24. Document ID: US 5525576 A

L12: Entry 24 of 26

File: USPT

Jun 11, 1996

US-PAT-NO: 5525576

DOCUMENT-IDENTIFIER: US 5525576 A

TITLE: Seed hull extract assimilation agents for agrochemical compositions

DATE-ISSUED: June 11, 1996

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Medina-Vega; Luis R.	Chihuahua			MX
Hickey; Joseph A.	Lakeland	FL	33813	
Dillon; Lewis E.	McAllen	TX	78504	

US-CL-CURRENT: 504/358; 504/177, 504/206, 504/211, 504/212, 504/213, 504/214, 504/215, 504/248, 504/292, 504/299, 504/353, 504/354, 514/231.2, 514/477, 514/783, 514/784, 514/946

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KIMC
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☒ 25. Document ID: US 4159901 A

L12: Entry 25 of 26

File: USPT

Jul 3, 1979



US-PAT-NO: 4159901

DOCUMENT-IDENTIFIER: US 4159901 A

TITLE: Corrosion inhibited agricultural compositions

DATE-ISSUED: July 3, 1979

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Beestman; George B.	St. Louis	MO		
Prill; Erhard J.	Kirkwood	MO		

US-CL-CURRENT: 504/206; 252/395, 422/12, 422/14, 422/15

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 26. Document ID: US 20030104943 A1 WO 200269718 A2

L12: Entry 26 of 26

File: DWPI

Jun 5, 2003

DERWENT-ACC-NO: 2002-759805

DERWENT-WEEK: 200339

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TITLE: Pesticidal concentrate compositions useful for controlling growth of e.g. morning-glory comprises oxalic acid, its salt or ester

INVENTOR: ABRAHAM, W; AGBAJE, H E ; ARHANCET, G B ; BECHER, D Z ; BRINKER, R J ; CHEN, X ; GILLESPIE, J L ; GLAENZER, J A ; GRAHAM, J A ; HENKE, S L ; LENNON, P J ; MAHONEY, M D ; PALLAS, N R ; WIDEMAN, A S ; WRIGHT, D R ; XU, X C ; REYNOLDS, T L

PRIORITY-DATA: 2001US-0988353 (November 19, 2001), 2001US-273234P (March 2, 2001), 2001US-274368P (March 8, 2001), 2001WO-US16550 (May 21, 2001), 2001US-0926521 (November 14, 2001), 2002US-0926521 (April 26, 2002)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 20030104943 A1	June 5, 2003		000	A01N057/18
WO 200269718 A2	September 12, 2002	E	343	A01N057/20

INT-CL (IPC): A01 N 37/04; A01 N 57/18; A01 N 57/20

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L12: Entry 2 of 26

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104943

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104943 A1

TITLE: Novel surfactants and formulations

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lennon, Patrick J.	Webster	MO	US	
Chen, Xiangyang	Chesterfield	MO	US	
Arhancet, Graciela B.	Creve Coeur	MO	US	
Glaenzer, Jeanette A.	University City	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	
Becher, David Z.	Point Court	MO	US	
Wright, Daniel R.	St. Louis	MO	US	
Agbaje, Henry E.	St. Louis	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	
Abraham, William	Wildwood	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Pallas, Norman R.	Florissant	MO	US	
Wideman, Al S.	St. Louis	MO	US	
Mahoney, Martin D.	St. Peters	MO	US	
Henke, Susan L.	Webster Groves	MO	US	

APPL-NO: 09/ 926521 [PALM]

DATE FILED: April 26, 2002

## PCT-DATA:

DATE-FILED	APPL-NO	PUB-NO	PUB-DATE	371-DATE	102(E)-DATE
May 21, 2001	PCT/US01/16550				

INT-CL: [07] A01 N 57/18

US-CL-PUBLISHED: 504/206

US-CL-CURRENT: 504/206

REPRESENTATIVE-FIGURES: NONE

## ABSTRACT:

A herbicidal composition is provided comprising an aqueous solution of N-phosphonomethylglycine, predominantly in the form of the potassium salt thereof, at a concentration of at least 300 g a.e./l of the composition; and a surfactant component in solution or stable suspension, emulsion, or dispersion in the water,

comprising one or more surfactants in a total amount of about 20 to about 300 g/l of the composition, wherein the composition has a viscosity of less than about 250 centipoise at 0.degree. C. or a Gardner color value less than 10.

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L12: Entry 3 of 26

File: PGPB

May 22, 2003

PGPUB-DOCUMENT-NUMBER: 20030096708  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030096708 A1

TITLE: Pesticide concentrates containing etheramine surfactants

PUBLICATION-DATE: May 22, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Agbaje, Henry E.	St. Louis	MO	US	
Becher, David Z.	St. Louis	MO	US	
Bates, Chris	Ballwin	MO	US	
Seifert-Higgins, Simone	Pacific	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				2

APPL-NO: 09/ 988340 [PALM]  
DATE FILED: November 19, 2001

## RELATED-US-APPL-DATA:

Application 09/988340 is a continuation-in-part of US application 09/926521, filed April 26, 2002, PENDING  
Application 09/926521 is a a-371-of-international WO application PC/T/US01/16550, filed May 21, 2001, UNKNOWN  
Application is a non-provisional-of-provisional application 60/273234, filed March 2, 2001,  
Application is a non-provisional-of-provisional application 60/274368, filed March 8, 2001,

INT-CL: [07] A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/365

US-CL-CURRENT: 504/365

## ABSTRACT:

Diamines or other polyamines increase the compatibility of ether amine surfactants with pesticide formulations such as those containing glyphosate or a salt or ester thereof.

## REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application No. 09/926,521, filed Nov. 14, 2001, which was the National Stage of International Application No. PCT/US01/16550, filed May 21, 2001, which claims the benefit of U.S.

Provisional Application No. 60/206,628, filed May 24, 2000, U.S. Provisional Application No. 60/205,524, filed May 19, 2000, U.S. Provisional Application No. 60/273,234, filed Mar. 2, 2001, and U.S. Provisional Application No. 60/274,368, filed Mar. 8, 2001.

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L12: Entry 4 of 26

File: PGPB

May 8, 2003

PGPUB-DOCUMENT-NUMBER: 20030087764

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030087764 A1

TITLE: Stable liquid pesticide compositions

PUBLICATION-DATE: May 8, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Pallas, Norman R.	Florissant	MO	US	
Gillespie, Jane L.	St. Louis	MO	US	
Singh, Lata	Ellisville	MO	US	
Xu, Xiaodong C.	Valley Park	MO	US	

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				02

APPL-NO: 09/ 988352 [PALM]

DATE FILED: November 19, 2001

## RELATED-US-APPL-DATA:

Application 09/988352 is a continuation-in-part of US application 09/926521, filed April 26, 2002, PENDING

Application 09/926521 is a a-371-of-international WO application PC/T/US01/16550, filed May 21, 2001, UNKNOWN

Application is a non-provisional-of-provisional application 60/206628, filed May 24, 2000,

Application is a non-provisional-of-provisional application 60/205524, filed May 19, 2000,

Application is a non-provisional-of-provisional application 60/273234, filed March 2, 2001,

Application is a non-provisional-of-provisional application 60/274368, filed March 8, 2001,

INT-CL: [07] A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/365

US-CL-CURRENT: 504/365

## ABSTRACT:

Aqueous pesticidal concentrate emulsions or microemulsions are described which are storage stable after exposure to temperatures ranging from 60.degree. C. to -20.degree. C.

## REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application Ser. No.

09/926,521, filed Nov. 14, 2001, which was the National Stage of International Application No. PCT/US01/16550, filed May 21, 2001, which claims the benefit of U.S. Provisional Application No. 60/206,628, filed May 24, 2000, U.S. Provisional Application No. 60/205,524, filed May 19, 2000, U.S. Provisional Application No. 60/273,234, filed Mar. 2, 2001, and U.S. Provisional Application No. 60/274,368, filed Mar. 8, 2001.

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L12: Entry 6 of 26

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

## INVENTOR-INFORMATION:

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Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				02

APPL-NO: 09/ 988353 [PALM]  
DATE FILED: November 19, 2001

## RELATED-US-APPL-DATA:

Application 09/988353 is a continuation-in-part-of PENDING application 09/926521, filed 2, 0000,  
Application 09/926521 is a a-371-of-international WO application PC/T/US01/16550, filed May 21, 2001, UNKNOWN  
Application is a non-provisional-of-provisional application 60/206628, filed May 24, 2000;  
Application is a non-provisional-of-provisional application 60/205524, filed May 19, 2000,  
Application is a non-provisional-of-provisional application 60/273234, filed March 2, 2001,  
Application is a non-provisional-of-provisional application 60/274368, filed March 8, 2001,

INT-CL: [07] A01 N 57/18, A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/206; 504/363  
US-CL-CURRENT: 504/206; 504/363

## ABSTRACT:

Pesticidal concentrate and spray compositions are described which exhibit enhanced efficacy due to the addition thereto of a compound which increases cell membrane permeability, suppresses oxidative burst, or increases expression of hydroxyproline-rich glycoproteins.



## REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application Ser. No. 09/926,521, filed Nov. 14, 2001, which was the National Stage of International Application No. PCT/US01/16550, filed May 21, 2001, which claims the benefit of U.S. Provisional Application No. 60/206,628, filed May 24, 2000, U.S. Provisional Application No. 60/205,524, filed May 19, 2000, U.S. Provisional Application No. 60/273,234, filed Mar. 2, 2001, and U.S. Provisional Application No. 60/274,368, filed Mar. 8, 2001.

1. The first step is to identify the problem. This involves understanding the current situation and what needs to be improved.

Print

May 16, 2002

TITLE: Compositions including ether-capped poly(oxyalkylated) alcohol wetting agents

[0054] Suitable organic acids include: carboxylic acids, such as acetic acid, oxalic acid, glycolic acid, citric acid, tartaric acid, maleic acid and oxydisuccinic acid; halogenated carboxylic acids, such as trifluoroacetic acid, heptafluorobutyric acid, dichloroacetic acid, and trichloroacetic acid; and sulfonic and sulfinic acids and their salts such as p-toluenesulfonic acid, p-toluenesulfinic acid, methanesulfonic acid, trifluoromethanesulfonic acid, 4-bromobenzenesulfonic acid, naphthalenesulfonic acid, (.+.-)-10-camphorsulfonic acids, xylenesulfonic acid, cumenesulfonic acid, and alkylbenzene sulfonic acid.

[0092] Suitable biocides include, but are no limited to, insecticides, such as organophosphorus compounds disclosed in U.S. Pat. No. 3,244,586, O,O-diethyl O-(3,5,6-trichloropyridine-2-yl) phosphorothioate, also known as chlorpyrifos, see WO 99/33340 published Jul. 8, 1999 and WO 99/29171 published Jun. 17, 1999; miticides; aphicides; fungicides, such as zinc ethylenebis(dithiocarbamate), nickel dimethyldithiocarbamate, and methyl-1(butylcarbamoyl)-2-benzimidazolecarbamate, see WO 99/29171 published Jun. 17, 1999; molluscicides; bacteriocides; acaricides, nematocides; plant growth regulators, such as N-methoxycarbonyl-N'-4-methylphenylcarbamoylethylisourea, sodium naphthaleneacetate, triazine herbicides, such as 2-methylthio-4,6-bisethylamino-1,3,5,-triazine, diphenylether herbicides such as 2,4-dichlorophenyl-4'-nitrophenylether, urea herbicides, carbamate herbicides, thiolcarbamate herbicides, pyridinium herbicides, aniline herbicides, pyrazole herbicides and the like, see WO 99/29171 published Jun. 17, 1999; defoliants, such as agent orange; gametocides; herbicides, such as acetochlor, alachlor, metolachlor, aminotriazole, asulam, bentazon, bialaphos, paraquat, bromacil, clethodim, sethoxydim, dicamba, diflufenican, pendimethalin, acifluorfen, fosamine, flupoxam, bromoxynil, imazaquin, norflurazon, 2,4-D, 2,4,5-T, diclofop, fluometuron, chlorimuron, triallate, atrazine, salts of N-phosphonomethylglycine (these are also known as the glyphosates, such as in the herbicidal compositions ROUNDUP.RTM. and ACCORD.RTM. both available from Monsanto, and TOUCHDOWN.RTM. available from Zeneca), and monoisopropylamine salts of N-phosphonomethylglycine. Other suitable herbicides may be found in U.S. Pat. No. 6,093,680, Gillespie et al., issued Jul. 25, 2000, and U.S. Pat. No. 4,933,002, Petroff et al., issued Jun. 12, 1990 and in WO 99/33340 published Jul. 8, 1999; algicides; viricides; insect repellents, such as 2-ethyl-1,3-hexanediol, N-octyl bicycloheptene dicarboxamide, N,N-diethyl-M-toluamide, 2,3,4,5-bis(2-butylene)tetrahydro-2furaldehyde; Di-n-propyl isocinchomerate, 2-hydroxyethyl-n-octyl sulfide, see WO 99/33340 published July 8 1999; and mixtures thereof.

5 24A 24B 24C Components % by weight % by weight % by weight 1) Atrazine 31 31 31 2) Metolachlor 21 21 21 3) Ether capped 4.6 1.5 2.5 poly(oxyalkylated) alcohol 4) Soprophor 1.2 2 2.5 4D384 5) Geropon 1.2 4 3 DOS/PG 6) 1,2 Propylene 5 5 2 glycol 7) Rhodorsil 426 0.3 0.3 0.3 8) Proxel BD 0.12 0.12 0.12 9) Rhodopol 23 0.12 0.12 0.12 10) Water Balance to Balance to Balance to 100 100 100 1) Atrazine is the solid form herbicide insoluble in water. 2) Metolachlor is a liquid form herbicide dissolved in a hydrophobic organic solvent. 3) Ether capped poly(oxyalkylated) alcohol is the nonionic, low foaming wetting agent employed in Example 14. 4) Soprophor 4D384

(Rhodia) is an anionic surfactant. The chemical name is Tristyrylphenol-16 EO, ammonium sulfate. 5) Geroxon DOS/PG (Rhodia) is a dialkyl-sulfosuccinate salt. The chemical name is sodium dioctyl sulfosuccinate (65% in propyleneglycol). 6) 1,2 Propylene glycol is used as an antifreezer. 7) Rhodorsil 426 (Rhodia) is a polymethysiloxan defoaming agent. 8) Proxel BD (ICI) is the preservative/biocide sodium 1,2 benzisothiazol-3(2H)-one. 9) Rhodopol 23 (Rhodia) is a heteropolysaccharide thickener. 10) Water is used as balance.

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L12: Entry 10 of 26

File: PGPB

Apr 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020049140  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020049140 A1

TITLE: Solid glyphosate-formulation and manufacturing process

PUBLICATION-DATE: April 25, 2002

## INVENTOR-INFORMATION:

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Dittrich, Gunter	Magdeburg		DE	
Muller, Bernd	Magdeburg		DE	

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NAME	CITY	STATE	COUNTRY	TYPE CODE
Schirm AG				03

APPL-NO: 09/ 969168 [PALM]  
DATE FILED: October 2, 2001

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
DE	100 52 489.3	2000DE-100 52 489.3	October 23, 2000

INT-CL: [07] A01 N 57/18

US-CL-PUBLISHED: 504/206

US-CL-CURRENT: 504/206

## ABSTRACT:

Disclosed is a solid formulation of the herbicidal active agent glyphosate [N-(phosphonomethyl)glycine] compressed into tablet form. It is applied in the agricultural and horticultural sectors to destroy unwanted vegetation. The solid formulation according to the invention consists essentially of free glyphosate acid, salifying agents (alkali or ammonium hydrogencarbonate or carbonate in conjunction with solid organic acids), biological activating agents and diluents. A suitably sized tablet can consequently be adapted to supply an appropriate dose of spray mixture per surface unit for small-scale users. Submerging in water causes the glyphosate to convert into a soluble salt. The resulting carbon dioxide facilitates rapid disintegration of the tablet.

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L12: Entry 13 of 26

File: USPT

Nov 6, 2001

DOCUMENT-IDENTIFIER: US 6313074 B1

TITLE: Effect enhancer for agricultural chemical

Brief Summary Text (19):

Examples of the cationic surfactant include polyoxyethylene alkylamine, polyoxypropylene alkylamine, for example, polyoxyethylene tallow amine, polyoxyethylene oleylamine, polyoxyethylene soy amine, polyoxyethylene cocoamine, synthetic polyoxyethylene alylamine, polyoxyethylene octylamine, alkanolamine alkyl ester compounds mentioned in WO 95/33379, polyoxyalkylene thereof, quaternary ammonium compounds derived from these compounds, and mixtures thereof.

Brief Summary Text (32):

Examples of the aromatic and aliphatic carboxylic acid chelating agents include citric acid, oxalic acid, glycolic acid, pyruvic acid, anthranilic acid and salts thereof.

Brief Summary Text (46):

Examples of the herbicides include acid amide-containing herbicides such as Stam (3,4-dichloropropionanilide, DCPA) and alachlor (2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide); urea-containing herbicides such as DCMU (3-(3,4-dichlorophenyl)-1,1-dimethylurea) and linuron (3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea); dipyrldyl-containing herbicides such as paraquat (1,1'-dimethyl-4,4'-bipyridium dichloride) and diguat (6,7-dihydrodipyrido[1,2-a:2',1'-c] pyranzinedium dibromide); diazine-containing herbicides such as bromacil (5-bromo-3-sec-butyl-6-methyluracil); S-triazine-containing herbicides such as simazine (2-chloro-4,6-bis(ethylamino)-1,3,5-triazine and simetryn (2,4-bis(ethylamino)-6-methylthio-1,3,5-triazine; nitrile-containing herbicides such as DBN (2,6-dichlorobenzonitrile); dinitroaniline-containing herbicides such as trifluralin (.alpha.,.alpha.,.alpha.-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine); carbamate-containing herbicides such as benthocarb (Saturn) (S-p-chlorobenzyl-N,N-diethyl thiocarbamate and MCC (methyl-3,4-dichlorocarbonilate); diphenyl ether-containing herbicides such as NIP (2,4-dichlorophenyl-p-nitrophenyl ether); benzoic acid-containing herbicides such as MDBA (dimethylamine-3,6-dichloro-o-anisilate); phenoxy-containing herbicides such as 2,4-D sodium salt (sodium 2,4-dichlorophenoxy acetate), Mapica ([4-chloro-o-tolyl)oxy]aceto-o-chloroanilide); organic phosphorus-containing herbicides such as glyphosate (N-phosphonomethyl)glycine or its salt), bialaphos (sodium salt of L-2-amino-4-[(hydroxy) (methyl)=phosphinoyl]butyryl-L-alanyl-L-alanine) and glufosinate (ammonium-DL-homoalanin-4-yl(methyl) phosphinate); aliphatic herbicides such as Na salt of TCA (sodium trichloroacetate); sulfonylurea-containing herbicides such as thifensulfuronmethyl [methyl-3-(4-methoxy-6-methyl-1,3,5-triazin-2-ylcarbamoyl)sulfamoyl]-2-then oate] and flazasulfuron [1-(4,6-dimethoxypyrimidine-2-yl)-3-(3-trifluormethyl-2-pyridylsulfonyl)ur ea].

Brief Summary Text (47):

Among these herbicides, the acid amide-containing herbicides, the diazine-containing herbicides, the nitrile-containing herbicides, the dinitroaniline-containing herbicides, the benzoic acid-containing herbicides and the organic

phosphorus-containing herbicides are preferable, and the organic phosphorus-containing herbicides are particularly preferable. Above all, bialaphos (sodium salt of L-2-amino-4-[(hydroxy)(methyl)=phosphinoyl]butyryl-L-alanyl-L-alanine), glufosinate (ammonium-DL-homoalanin-4-yl(methyl) phosphinate) and glyphosate (N-(phosphonomethyl)glycine or its salt) are preferable.

Detailed Description Text (6):

Each of the above-mentioned effect enhancers for agricultural chemicals was dissolved in ion-exchanged water so as to prepare a 0.2% by weight diluted solution. With the thus obtained 0.2% by weight diluted solution, each of a round-up solution (an effective content of a glyphosate isopropylamine salt=41% by weight), a Banvel D solution (an effective content of an MDBA dimethylamine salt=50.0% by weight) and an aqueous Herbiace solution (an effective content of a bialaphos=20% by weight) was diluted 300 times to obtain 3 kinds of agricultural chemical formulations per effective component.

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L12: Entry 15 of 26

File: USPT

Jan 30, 2001

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith.

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphorus containing acid group suspended in finegrained form in a liquid phase, and at least 5% by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (6):

It is well known that ammonium sulphate acts synergistically on the biological effect of glyphosate and glufosinate. For instance the patent literature contains many examples of combinations of glyphosate and ammonium sulphate, and in practice the farmer usually adds supplementary ammonium sulphate when diluting the glyphosate for use.

Brief Summary Text (7):

Danish patent application no. 2348/88 describe liquid, aqueous solutions of glyphosate with ethoxylated monoamines as surfactants. The possibility of dissolving additional ammonium sulphate exists, but this will lead to a lowering of the dissolvable quantity of glyphosate. Therefore, the maximum amount of glyphosate in a solution containing 280 g/l ammonium sulphate is approximately 120 g/l.

Brief Summary Text (8):

UK patent application GB 2.233.229 A describes a similar system, the ethoxylated monoamines being replaced by ethoxylated diamines. The typical, aqueous solutions contain 200 g/l ammonium sulphate and 75 g/l of glyphosate as its isopropylammonium salt.

Brief Summary Text (9):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (10):

In European patent application EP 441.764 A1 is mentioned, that alkoxylated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (11):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (12):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkyl-glycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (13):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (14):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (15):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (17):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (18):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (19):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (20):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (21):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a



salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (22):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (33):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1 corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example, the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (36):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (43):

d) In suspension preparations the amount of suspended solid material in a liquid phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended. When the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Brief Summary Text (51):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy(methyl)phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy(methyl)phosphinoyl)-L-homoalanyl-L-alanyl-L-alanine and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Brief Summary Text (58):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being

emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%, compare claim 19.

Brief Summary Text (59):

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

Brief Summary Text (60):

To produce the herbicidal solution/suspension for use, the farmer may make use of the additive, too. He just has to mix it with a glyphosate- or a glufosinate preparation. The form of the herbicide is of minor importance in this connection, for instance a finely grinded powder, a solid granulate, a solution in an appropriate solvent or even a suspension may be used.

Brief Summary Text (72):

Preferred herbicidal compositions are such, in which the selected herbicide is glyphosate or glufosinate, and the selected electrolyte is ammonium sulphate.

Brief Summary Text (75):

The wording "surfactants" includes emulsifiers, as well as dispersing and wetting agents. A surfactant might be a polymer with a molecular weight of below approximately 15,000 Dalton with many hydrocarbyl- and/or hydrocarbylene groups, or it must always contain at least one hydrocarbyl- or hydrocarbylene group containing at least 8 carbon atoms, or a polymethylessiloxane with at least 8 silicium atoms. Besides the surfactant must contain at least one hydrophilic group, for example a polyoxyethylene group, an amine group, a sulfonic acid group or a phosphate ester group, but this is no exhaustive characterization of a surfactant. Surfactants comprise compounds described in sales brochures relating to emulsifiers, dispersing and wetting agents and in catalogues and works of reference for such. As examples of works of reference McCutcheon's publications: "Detergent & Emulsifiers International Edition" and "North American Edition", Glen Rock, N.J. 07452, USA are to be mentioned.

Brief Summary Text (84):

The cationic surfactants may be selected from the group comprising C.sub.8-30 -hydrocarbylamine and C.sub.8-30 -hydrocarbyl-di- and triamine being alkoxyated with min. 1 preferably min. 2, especially min. 5 and specially min. 8 oxyethylene and/or oxypropylene groups; quaternary amines with min. one C.sub.8-30 -hydrocarbyl and/or hydrocarbylene group and their alkoxyated derivatives; and amine modified polymethylessiloxanes.

Brief Summary Text (90):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of ammonium sulphate to known products, and they are known to possess a particularly satisfying biological effect, it seems redundant to prove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Brief Summary Text (98):

The compositions of the invention might comprise hygroscopic compounds, possibly

also acting to stabilize pH and selected from the group consisting of hydroxycarboxylic acids, di- and tricarboxylic acids and their hydroxy acids, said acids being present as free acids and having a solubility in water at 20.degree. C. of at least 1% by weight. Examples of such acids are lactic acid, oxalic acid, succinic acid, tartaric and citric acid. The amount of these acids in the composition may be approximately 0.1-22%, preferably 0.4-16%, especially 1-11% and specially 2-7%.

Brief Summary Text (107):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Brief Summary Text (112):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (2):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (3):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirkonium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (4):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by Attagel, and the grinding was continued for approximately 5 minutes.

Detailed Description Text (6):

Samples of the above compositions were stored in 100 ml glass bottles with screw caps for 1 to approximately 4 weeks before the beginning of the accelerated testing. It was initially evaluated, whether the sample had separated a clear aqueous phase, and whether the surfactant had separated out on its own. The results of all evaluations are listed in table A. Subsequently the sample was shaken. The viscosity was visually evaluated, and the average particle size of the grinded glyphosate particles was estimated microscopically at 256.times.. (It is very difficult to use a particle sizer for so many samples, because the samples must be measured in concentrated salt solutions possibly further saturated with glyphosate, in order to ensure, that the samples are not dissolved in the water. It is also important that the concentrated salt solution does not contain undissolved impurities, which might disturb the measurements). It was also estimated, whether the added surfactants had separated out as oily drops. If so, the estimated size of the drops was noted. If no oily drops could be observed, a "n.d." (not detected) is stated in the table. It should be noted, that any microscopic airbubbles present may give rise to a false positive result.

Detailed Description Text (18):

After this testing period both groups of samples were cooled to ambient temperature and evaluated as mentioned above. Supplementary the speed of dissolution was determined as follows: 1 ml suspension was pipetted off and placed in a 150 ml beaker containing 100 ml deionized water. The mixture was stirred on a magnetic stirrer of moderate speed using a 4 cm magnet so as to produce an approximately 1 cm deep vortex in the diluent water, and the period of time until no more undissolved glyphosate could be observed was measured in seconds. All observations are listed in table A.

Detailed Description Text (24):

Experiments 6-10, 11-15, 16-20, 21-25 and 26-29 in the tables B, C, D, E, and F describe glyphosate compositions comprising various surfactants in varying amounts. The ratio glyphosate/surfactant is about 2/1 corresponding to the usual ratio in most commercial products. The amount of finely distributed fillers varies from 0 to 2% by weight. In all of the experiments the amount of the electrolyte ammonium sulphate is varying from app. 20 to 27% by weight. The grinding is performed in a mini-mill as described for the samples 3-5 in table A, the sulfuric acid addition, however, being omitted.

Detailed Description Text (30):

Experiments 31-35, 36-40, 41-45 and 46-49 in the tables G, H, I and J relate to various glyphosate compositions. Experiments 31-33 (table G) relate to compositions with ammonium salts different from ammonium sulphate. Experiments 34 and 35 (table G) relates to compositions comprising herbicide only suspended in an electrolyte solution. Experiments 36-40 (table H) show the use of potassium thiocyanate, sodium bromide and ammonium acetate as electrolyte. In the experiments 36 and 37, one of the acid groups in glyphosate is transformed into the sodium salt. In experiment 38, a little amount only of glyphosate is transformed into the sodium salt. In experiments 39 and 40, one of the acid groups in glyphosate is transformed into its ammonium salt. The experiments 41-45 (table I) relate to compositions comprising viscosity regulating, hygroscopic compounds. These are glycerine, propylene glycol, polyethylene glycol and lactic acid. Obviously the addition of these to the aqueous phase caused no tendency to separation of undissolved electrolyte. Experiments 46 and 47 relate to compositions further comprising oil. Experiment 48 and 49 relate to compositions comprising herbicide suspended in an electrolyte solution and small amounts of a viscosity regulating filler, but no surfactant.

Detailed Description Text (35):

In the experiments 46 and 47, the oils apparently do not disperse onto the grinded glyphosate, unlike the surfactants. This conclusion is based partly on the microscopy and partly on the experiment 46, in which the sample, which had been stored at varying temperatures, at the end of the experiment had separated two upper, clear phases. This was not observed in experiment 47. In both samples, the oil was uniformly re-distributed in the compositions after shaking.

Detailed Description Text (47):

The actual surfactant of the French example 1, a derivative of an ethoxylated fatty amine, is not commercially available, and is synthesized from ethylene oxide (extremely poisonous). Experiments 57 and 58 are intended to show, that compounds being comparable to this surfactant do not solubilize the ammonium sulphate. Consequently the amount of dissolved ammonium sulphate in example 1 in FR 2.663.315 can not exceed 5% w/w. Genamin S 25 is the most ethoxylated of the commercially available ethoxylated fatty amines. In experiment 57 Genamin S 25 is admixed with propylene glycol, before the mixture is added to the ammonium sulphate solution. PEG 400 is polyethylene glycol comprising on an average 8 moles of ethylene glycol. Since this compound does not comprise any hydrophobic group, it is more hydrophilic than ethoxylated fatty amines, and therefore probably has a greater impact on the solubility of ammonium sulphate. In experiment 58 PEG 400 is admixed with the propylene glycol, before the mixture is added to the ammonium sulphate solution. Both example 57 and 58 show a precipitation of ammonium sulphate following the addition of the propylene glycol mixtures to the aqueous ammonium sulphate solutions.

Detailed Description Text (52):

The product of example 60 has been produced by initially dissolving the ammonium sulphate in water (40% ammonium sulphate solution) followed by admixture of propylene glycol, leading to a precipitation of ammonium sulphate. The stirring on the mini-mill was started, and the glyphosate was added in the usual way followed by admixture of Genapol OX-130.

Detailed Description Text (54):

At normal temperatures an ammonium sulphate solution comprises approximately 40% ammonium sulphate. In experiment 61 20 g ammonium sulphate was dissolved in the water phase followed by addition of propylene glycol, causing a precipitation of ammonium sulphate. Another 20 g ammonium sulphate was finely grinded in a blender with a view to adding it slowly during grinding before the addition of glyphosate, before the addition of Genapol and after the addition of Genapol, respectively.

Detailed Description Text (58):

A preferred composition of glyphosate in electrolyte solution comprises the following:

Detailed Description Text (59):

169.1 g glyphosate

Detailed Description Text (64):

169.1 g glyphosate is dissolved in 266 g water and 80 g aqueous 25% w/w ammonia solution together with 159.4 g ammonium sulphate in a beaker and is transferred to another container under vigorous stirring.

Detailed Description Paragraph Table (2):

TABLE A	Experiment no.	1	2	3	4	5	Compo-	nents	Composition in %	Deionized	41.6	41.1
	41.0	41.0	40.8	water	Ammonium	27.8	27.4	27.4	27.4	27.2	sulphate	<u>Glyphosate</u> , 20.8
	20.6	20.6	20.6	20.4	98%	Genamin T	6.9	6.8	150	(1)	Genamin O	6.8 80 (2) Genamin C 6.8
	100	(3)	Genamin C	6.8	020	(4)	Sulfuric	app.	1.5	app.	1.4	2.1 2.1 2.7 acid, 98%
	Attagel	(5)	1.4	2.7	2.1	2.1	2.1	Total weight	144	146	146	146 147 (g) Density 1.30
	1.29	1.28	1.28	1.25	(g/ml)	<u>Glyphosate</u>	270	266	264	264	255	(g/l) Ammonium 361 353 351
	351	340	sulphate	(g/l)	Evaluation before storage	Appearance	15%	upp.	10%	upp.	10%	upp.
	upp.	10%	upp.	10%	upp.	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	Viscosity
	pseudo-	slightly	slightly	pseudo-	pseudo-	plastic	viscous	viscous	plastic	plastic	plastic	plastic
	Particle	app.	10	app.	10	5-10	app.	10	5-10	size	(.mu.m)	Oil drops n.d. n.d. n.d.
	n.d.	n.d.	(.mu.m)	Evaluation after storage at various temperatures	Appearance	30%	upp.	20%	upp.	15%	upp.	25%
	upp.	20%	upp.	15%	upp.	25%	upp.	25%	upp.	cl. phase	cl. phase	cl. phase
	phase	Viscosity	easily	suffici-	suffici-	easily	easily	ently	ently	Particle	app.	10
	10-15	app.	10	10-15	5-10	size	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d. (.mu.m)
	Speed of	4	6	3	3	2	dissol.	(s)	Evaluation after storage 14 days at 55.degree. C.			
	Appearance	15%	upp.	5%	upp.	10%	upp.	10%	inner	15%	upp.	cl. phase
	phase	cl.	phase	cl.	phase	cl.	phase	cl.	phase	cl.	phase	cl.
	phase	cl.	phase	cl.	phase	cl.	phase	cl.	phase	cl.	phase	cl.
	viscous	plastic	plastic	plastic	plastic	plastic	plastic	plastic	plastic	plastic	plastic	plastic
	Particle	app.	10	10-15	app.	10	10-15	app.	10	10-15	app.	10
	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	(.mu.m)	Speed of	3	4

Detailed Description Paragraph Table (3):

TABLE B	Experiment no.	6	7	8	9	10	Component	Composition in %	Deionized	40.5	40.5	
	40.5	40.5	40.5	water	Ammonium	27.0	27.0	27.0	27.0	27.0	sulphate	<u>Glyphosate</u> , 20.3
	20.3	20.3	20.3	20.3	98%	Ethoquad	10.2	C/25	(6)	Emcol CC	10.2	55 (7) Ampholyt 10.2
	SKKP-70	(8)	Synperonic	10.2	NP-10	(9)	Tween	20	10.2	(10)	Attagel	(5) 2.0 2.0 2.0 2.0
	2.0	Total weight	148	148	148	148	148	(g)	Density	1.28	1.27	1.27 1.27 1.27 (g/ml)
	<u>Glyphosate</u>	260	258	258	258	258	(g/l)	Ammonium	346	343	343	343 343 sulphate (g/l)
	Evaluation before storage	Appearance	no se-	no se-	15%	lower	15%	lower	10%	lower	lower	lower
	paration	paration	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase
	slightly	slightly	viscous	viscous	viscous	viscous	viscous	viscous	viscous	viscous	viscous	viscous
	10-15	10	size	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d.	25-100	(.mu.m)	Evaluation after
	storage at various temperatures	Appearance	20%	upp.	30%	upp.	no se-	20%	upp.	15%	upp.	15%
	upp.	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase
	passende	passende	passende	viscous	viscous	viscous	viscous	viscous	viscous	viscous	viscous	viscous
	app.	10	10-15	size	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d.	n.d.	(.mu.m)
	Speed of	2	2	3	3	2	dissol.	(s)	Evaluation after storage 14 days at 55.degree. C.	Appearance	10%	upp.
	upp.	25%	upp.	no se-	no se-	10%	upp.	cl. phase	cl. phase	paration	paration	cl. phase

Detailed Description Paragraph Table (4):

Detailed Description Paragraph Table (5):

Detailed Description Paragraph Table (6):

Detailed Description of Experimental Data														
TABLE E Experiment no. 21 22 23 24 25 Component Composition in % Deionized 40.5 41.4														
40.0	38.7	38.2	water	Ammonium	27.0	27.6	26.7	25.8	25.5	sulphate	Glyphosate,	20.3		
20.7	20.0	19.4	19.1	98% Berol OX	10.2	10.3	13.3	16.1	15.9	45-11	(21) Attagel	(5)	2.0	
1.3	Total weight	148	145	150	155	157	(g)	Density	1.26	1.26	1.26	1.25	1.25 (g/ml)	
Glyphosate	256	261	252	243	239	(g/l)	Ammonium	340	348	337	323	319	sulphate (g/l)	
Evaluation before storage Appearance no se- 15% lower 15% lower 15% lower 10% lower														
paration cl. phase cl. phase cl. phase Viscosity pseudo- easily easily														
easily slightly plastic viscous Particle app. 15 10-15 app. 15 10-15 app. 10 size														
(.mu.m) Oil drops <25 25-100 <25 25-100 25-100 (.mu.m) Evaluation after storage at														
various temperatures Appearance 5% upp. 35% upp. 30% inner 20% lower 5% inner cl.														
phase cl. phase cl. phase cl. phase cl. phase Viscosity clearly very ea- easily														
suffici- pseudo- pseudo- sily ently plastic plastic Particle 10-15 10-15 10-15 10-15														
app. 10 size (.mu.m) Oil drops <25 n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 2 2 3														
dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance no se- 30%														
upp. 15% inner 15% lower 10% lower paration cl. phase cl. phase cl. phase cl. phase														
Viscosity clearly very ea- easily suffici- pseudo- pseudo- sily ently plastic														



plastic Particle 10-15 10-15 app. 15 10-15 10-15 size (.mu.m) Oil drops <25 n.d.  
25-100 n.d. 25-100 (.mu.m) Speed of 10 1 1 2 3 dissol. (s)

Detailed Description Paragraph Table (7):

TABLE F Experiment no 26 27 28 29 30 Component Composition in % Deionized water 40.8  
40.5 40.9 47.2 40.5 Ammonium sulphate 27.2 27.0 27.3 20.3 27.0 Glyphosate, 98% 20.4  
20.3 20.5 20.3 20.3 Marlipal 1618/25 (22) 10.2 Radiesurf 7417 (23) 10.2 Berol OX  
45-11 (21) 10.3 10.2 Berol 533 (24) 10.2 Aerosil R 972 (20) 1.0 Attagel (5) 1.4 2.0  
2.0 2.1 Total weight (g) 147 148 146.5 148 148 Density (g/ml) 1.27 1.28 1.26 1.22  
1.26 Glyphosate (g/l) 345 346 258 248 256 Ammonium sulphate 259 260 344 248 340  
(g/l) Evaluation before storage Appearance no separation no separation no separation  
no separation no separation Viscosity slightly slightly pseudo- pseudo- pseudo-  
viscous viscous plastic plastic plastic Particle size (.mu.m) app. 15 app. 15 app.  
10 app. 15 app. 15 Oil drops (.mu.m) n.d. 25-100 25-100 25-100 <25 Evaluation after  
storage at various temperatures Appearance 10% upp. 15% upp. 30% upp. 30% upp. 15%  
upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity clearly pseudo-  
pseudo- pseudo- suffici- pseudo- plastic plastic plastic ently plastic Particle size  
(.mu.m) 10-15 app. 10 app. 10 10-15 app. 10 Oil drops (.mu.m) n.d. n.d. 25-100 n.d.  
n.d. Speed of dissol. (s) 2 2 2 2 3 Evaluation after storage 14 days at 55.degree.  
C. Appearance no separation no separation no separation 20% upp. no separation cl.  
phase Viscosity slightly pseudo- pseudo- easily viscous\* viscous plastic plastic  
Particle size (.mu.m) 10-15 app. 10 app. 10 app. 15 app. 10 Oil drops (.mu.m) n.d.  
n.d. n.d. n.d. n.d. Speed of dissol. (s) 7 3 2 2 17 \*Screw cap leaky, crystals from  
the liquid observed.

Detailed Description Paragraph Table (8):

TABLE G Experiment no. 31 32 33 34 35 Component Composition in % Deionized 27.4 34.0  
40.5 36.9 33.1 water Ammonium 41.1 17.0 sulfamate Ammonium 17.0 24.6 22.1 sulphate  
Ammonium 27.0 nitrate Glyphosate, 20.5 20.4 20.3 38.5 44.8 98% Berol OX 10.3 10.2  
10.2 45-11 (21) Attagel (5) 0.7 1.4 2.0 Total weight 146 147 148 130 145 (g) Density  
1.35 1.29 1.25 1.33 1.38 (g/ml) Glyphosate 277 263 254 512 618 (g/l) Electrolyte 555  
439 338 327 305 (g/l) Evaluation before storage Appearance 10% lower no se- no se-  
20% upp. 10% upp. cl. phase paration paration cl. phase cl. phase Viscosity easily  
slightly easily passende slightly viscous viscous viscous Particle app. 15 10-15  
10-15 20-25 app. 20 size (.mu.m) Oil drops 20-100 25-100 25-100 n.d. n.d. (.mu.m)  
Evaluation after storage at various temperatures Appearance 25% lower 10% upp. 30%  
upp. 30% upp. 20% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity  
easily pseudo- easily passende slightly plastic viscous viscous Particle app. 15  
10-15 10-15 25-30 app. 20 size (.mu.m) Oil drops <25 n.d. n.d. n.d. n.d. (.mu.m)  
Speed of 2 3 2 32 12 dissol. (s) Evaluation after storage 14 days at 55.degree. C.  
Appearance 15% lower no se- 30% upp. 15% upp. cl. phase paration cl. phase  
cl. phase cl. phase Viscosity easily pseudo- easily easily slightly plastic viscous  
Particle app. 15 10-15 app. 15 app. 25 app. 20 size (.mu.m) Oil drops n.d. n.d.  
25-100 n.d. n.d. (.mu.m) Speed of 3 5 2 16 6 dissol. (s)

Detailed Description Paragraph Table (9):

TABLE H Experiment no. 36 37 38 39 40 Component Composition in % Deionized 27.0 23.7  
37.8 27.6 26.3 water Kalium 42.1 thiocyanate Ammonium 40.5 39.5 sulphamate Natrium  
29.7 bromide Ammonium 33.8 acetate Glyphosate, 20.3 98% Glyphosate 20.3 23.0 Na-salt  
Glyphosate 27.6 23.0 NH.sub.4 -salt Berol OX 10.2 9.9 10.1 9.2 45-11 (21) Marlipal  
9.9 1618/25 (22) NaOH, 28% 1.4 Attagel (5) 2.0 1.3 0.7 1.8 1.3 Total weight 148 152  
148 163 152 (g) Density 1.33 1.24 1.39 1.35 1.35 (g/ml) Glyphosate 270 285 282 373  
310 (g/l) Electrolyte 539 522 413 456 533 (g/l) Evaluation before storage Appearance  
10% lower 5% lower 10% inner no se- no se- cl. phase cl. phase cl. phase paration  
paration Viscosity pseudo- suffici- easily pseudo- clearly plastic ently plastic  
psueplas. Particle app. 15 10-15 10-15 30-50 app. 15 size (.mu.m) Oil drops n.d. <25  
n.d. n.d. 25-100 (.mu.m) Evaluation after storage at various temperatures Appearance  
10% lower 10% lower 25% upp. no se- 10% lower cl. phase cl. phase cl. phase paration  
cl. phase Viscosity easily suffici- easily clearly clearly pseuplas. ently pseuplas.  
pseuplas. Particle 20-25 app. 15 10-15 app. 50 app. 20 size (.mu.m) Oil drops n.d.  
n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 5 3 9 2 dissol. (s) Evaluation after storage  
14 days at 55.degree. C. Appearance 10% lower 10% lower 20% upp. no se- no se- cl.  
phase cl. phase cl. phase paration paration Viscosity clearly suffici- easily  
clearly clearly pseuplas. ently pseuplas. pseuplas. Particle 15-20 10-15 app. 15  
30-50 app. 15 size (.mu.m) Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 7 8 5

21 5 dissol. (s)

Detailed Description Paragraph Table (10):

TABLE I Experiment no. 41 42 43 44 45 Component Composition in % Deionized 38.0 38.0  
 13.6 38.0 22.1 water Ammonium 20.5 32.2 sulfamate Ammonium 25.3 25.3 25.3 sulphate  
 Glyphosate, 19.0 19.0 20.6 19.0 25.0 98% Berol OX 9.5 9.5 10.3 9.5 45-11 (21)  
 Glycerin 6.3 34.3 Propylene 20.7 glycol PEG E200 6.3 (27) Lactic acid 6.3 Attagel  
 (5) 1.9 1.9 0.7 1.9 Total weight 158 158 146 158 140 (g) Density 1.27 1.25 1.30 1.27  
 1.34 (g/ml) Glyphosate 241 238 268 241 335 (g/l) Elektrolit 321 316 267 321 431  
 (g/l) Evaluation before storage Appearance no se- no se- no se- no se- 20% upp.  
 paration paration paration paration cl. phase Viscosity pseudo- pseudo- pseudo-  
 clearly easily plastic plastic plastic pseudo- plastic Particle app. 15 app. 10 app.  
 15 app. 15 app. 10 size (.mu.m) Oil drops 25-100 >100 n.d. 25-100 n.d. (.mu.m)  
 Evaluation after storage at various temperatures Appearance no se- 10% upp. 10%  
 lower 5% upp. 35% upp. paration cl. phase cl. phase cl. phase Viscosity  
 pseudo- pseudo- pseudo- clearly easily plastic plastic pseudo- plastic  
 Particle 10-15 app. 10 app. 15 app. 15 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d.  
 n.d. n.d. (.mu.m) Speed of 2 2 4 2 3 dissol. (s) Evaluation after storage 14 days at  
 55.degree. C. Appearance no se- no se- no se- no se- 25% upp. paration paration  
 paration paration cl. phase Viscosity clearly pseudo- pseudo- clearly easily pseudo-  
 plastic plastic pseudo- plastic plastic Particle app. 15 5-10 app. 15 app. 15 app.  
 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 8 2 5 2 3  
 dissol. (s)

Detailed Description Paragraph Table (11):

TABLE J Experiment no. 46 47 48 49 Component Composition in % Deionized water 38.0  
 38.0 40.5 57.6 Ammonium sulphate 25.3 25.3 27.0 14.3 Glyphosate, 98% 19.0 19.0 30.5  
 25.2 Berol 02 (13) 6.3 6.3 Hydropar 19 (25) 9.5 Radia 7131 (26) 9.5 Attagel 1.9 1.9  
 2.0 2.9 Total weight (g) 158 158 148 139 Density (g/ml) 1.22 1.21 1.34 1.22  
 Glyphosate (g/l) 232 230 409 174 Ammonium sulphate 309 306 362 307 (g/l) Evaluation  
 before storage Appearance 10% lower 15% lower no se- 10% upp. cl. phase cl. phase  
 paration cl. phase Viscosity suffici- suffici- pseudo- easily ently ently plastic  
 Particle size (.mu.m) app. 20 app. 15 10-15 20-25 Oil drops (.mu.m) >100 25-100 n.d.  
 n.d. Evaluation after storage at various temperatures Appearance 30% 2 30% lower 10%  
 upp. 10% upp. upp. cl. cl. phase cl. phase cl. phase phases Viscosity suffici-  
 pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 10-15  
 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 2 2 2 22  
 Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower 20% lower no  
 se- no se- cl. phase cl. phase paration paration Viscosity suffici- pseudo- pseudo-  
 easily ently plastic plastic Particle size (.mu.m) app. 15 app. 15 10-15 20-25 Oil  
 drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 4 5 2 4

Detailed Description Paragraph Table (12):

TABLE K Experiment no. 50 51 Component Composition in % Deionized water 42.8 41.7  
 Ammonium sulphate 28.6 27.8 Moussex 904 SE (28) 0.7 Ethoquad C/25 (6) 25.0 Berol OX  
 45-11 (21) 27.8 Attagel 40 (5) 3.6 2.0 Total weight (g) 140 144 Density (g/ml) 1.15  
 1.14 Glyphosate (g/l) -- -- Ammonium sulphate (g/l) 329 317 Evaluation before  
 storage Appearance 10% lower 10% lower cl. phase cl. phase Viscosity sufficiently  
 sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100 Evaluation  
 after storage at various temperature Appearance 30% lower 25% lower cl. phase cl.  
 phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops  
 (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C. Appearance 10%  
 lower 5% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size  
 (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

Detailed Description Paragraph Table (15):

TABLE N Experiment no. 59 60 61 62 Component Composition in g Deionized water 60.0  
 30.0 30.0 Ammonium sulphate 40.0 20.0 40.0 40.0 Propylene glycol 30.0 30.0 60.0  
 Glyphosate, 98% 30.0 30.0 30.0 30.0 Genapol OX 130 (30) 20.0 20.0 20.0 20.0  
 Viscosity Brook- 1800 3100 -- -- field at 20.degree. C. mPaxs mPaxs

Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, "Herbicidal glyphosate salt  
 concentrate", Aug. 30, 1993.



## CLAIMS:

5. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine.

7. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine in its free, non-neutralized form or completely or partly converted into its respective ammonium salt by reaction with ammonia.

22. A composition according to claim 1, which comprises a cationic surfactant selected from the group consisting of C.sub.8-30 -hydrocarbylamine and -diamine and -triamine being alkoxylated with at least 1 oxyethylene and/or oxypropylene group, a quaternary amine with at least one C.sub.8-30 -hydrocarbyl and/or hydrocarbylene group and an alkoxylated derivative thereof; and an amine modified polymethylsiloxane.

25. An activating additive (adjuvant) in concentrated form for admixture with compositions containing glyphosate- and/or glufosinate for combating weeds, said additive comprising at least one surfactant in an amount of 4-58% by weight being emulsified, suspended and/or dissolved in a liquid, aqueous phase, and at least one undissolved, fine-grained, not biologically active, viscosity regulating filler, said filler acting to prevent the separation of the surfactant and being present in an amount of at least 0.3% by weight, characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of at least 5% by weight.

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L12: Entry 18 of 26

File: USPT

Jun 6, 2000

DOCUMENT-IDENTIFIER: US 6071858 A

TITLE: Stable, dry compositions for use as herbicides

Brief Summary Text (4):

Agricultural formulations can be constructed to contain more than one active ingredient (a.i.) in a formulation. Examples of commercial herbicides that contain two active ingredients in a single formulation include alachlor/atrazine, bromacil/diuron, alachlor/glyphosate, clomazone/trifluralin, cyanazine/atrazine, and 2,4-D/2,4-MCPA. Combining active ingredients is advantageous because it allows the formulated product to be efficacious over a broader range of target pests. However, combining multiple active ingredient materials in a single formulation can be problematical, and may not always be attainable. Pairing active ingredients is highly ingredient specific, and it must first be established that the actives are chemically stable in the presence of one another. It is not uncommon that when two complex organic molecules, such as pesticide active ingredients, are brought together that a chemical incompatibility exists that causes one or both of the active ingredients to undergo a change in its chemical identity. These changes can be due to chemical interactions occurring at reactive sites on either or both of the compounds involved, or reactions catalyzed by reactive impurities that may be present. The rate of these reactions, and therefore the extent of the chemical change observed, may be rapid or slow. In practice, the progress of the reaction, or lack thereof, in a formulated pesticide can be followed by conducting chemical assays of the product over a period of time, and recording the percent loss of active ingredient. Since chemical reactions are temperature dependent, one may even conduct assays at various storage temperatures and, with the aid of classical reaction-kinetics techniques, determine the rate constant of the reaction and the half-life of the actives. Such calculations are often used to estimate the shelf-life of a product.

Brief Summary Text (20):

In another embodiment, the pH of the composition is adjusted by acidifying the Metribuzin prior to its addition to the composition. In this acidification step, the Metribuzin can be treated with an inorganic or organic acid. Suitable inorganic acids include sulfuric acid, nitric acid, hydrochloric acid and phosphoric acid. Suitable organic acids include carboxylic acids and dicarboxylic acids. Examples of carboxylic acids that can be used are aliphatic acids such as acetic and formic acid, or aromatic acids such as benzoic or salicylic acid. Examples of dicarboxylic acids that can be used are oxalic, phthalic, sebacic and adipic acids.

Brief Summary Text (28):

Suitable surface active agents, or mixtures thereof, that can be used include nonionic and anionic emulsifiers, wetting agents, and dispersants; such as polyethylene-fatty acid esters, phosphate esters, ethoxylated alkyl phenols, polyoxyethylene-fatty alcohol ethers, alkylaryl polyglycol ethers, sodium mono- and di-alkyl-sulfonates, sodium alkylsulfate, sodium mono- and di-alkylarylsulfonates, sulfonated kraft lignins, hydroxyalkylmethylcelluloses, polyoxyalkylene block copolymers, sodium alpha-olefin sulfonate, alkyl naphthalene sulfonate formaldehyde condensate, alkyl diphenylether sulfonates, alkyl diphenyloxide disulfonates, polycarboxylates, organosilicone block copolymers, derivatives of the N-methyl fatty acid taurides, sulfo-succinates, tristyrylphenols, ethoxylated alkylamines, alkylpolyglucosides, salts of dodecylbenzene sulfonic acid, and the like, including sodium, potassium, ammonium and amine salts.

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L12: Entry 20 of 26

File: USPT

Feb 1, 2000

DOCUMENT-IDENTIFIER: US 6020288 A

TITLE: Methods and compositions for enhancing cytochrome P450 in plants

Brief Summary Text (12):

U.S. Pat. No. 5,532,204 proposes foliar applied methanol at the R5 seed growth stage of legumes. U.S. Pat. No. 5,300,540 proposes preservation of freeze-dried plant cells with barrier compositions containing, polyethylene glycol, p-aminobenzoic acid, acetylsalicylic acid, cinnamic acid, benzoic acid, blended alcohol and other organics. U.S. Pat. No. 3,897,241 proposes application of ethanolamine formulations with carboxylic acids of less than 8 carbons, such as, oxalic acid, formic acid, acetic acid, phthalic acid and glutaric acid to fruit-bearing plants. U. S. Pat. No. 4,799,953, proposes polymeric condensates of the sulfur-polymers of thiolactic and thioglycolic acids, increasing the rate of growth and production of chlorophyll specific to tissue and hydroponic culture of Lemna minor. European Patent 465 907 A1 proposes compositions for stimulating the growth and ripening of plants comprised of at least one adduct of menadione bisulfite and a compound chosen from a group including pABA, nicotinamide, nicotinic acid, thiamine, tryptophan, histidine, or adenine. U.K. Patent Application 2 004 856 proposes plant growth stimulating compositions consisting of cysteine as the active component in formulations that also include sulfosalicylic acid, folic acid, an aldehyde, a magnesium salt, and a buffer. European Patent FR 2 689 905 A1 proposes a method for cloning DNA sequences coding for an NADPH Cytochrome P450 reductase implicated by survival of a deficient mutant of *Saccharomyces cerevisiae*.

Detailed Description Text (43):

Specific examples of amines which may be employed as reductants in the methods of the present invention include but are not limited to tyrosine, tyrosine ester, N-acetyltyrosine, tyrosine methylester, tyrosine methylester hydrochloride, tyramine, alanyltyrosine, levodopa, aminopyrine, phosphonomethylglycine, and combinations thereof.

Detailed Description Text (68):

The compositions of the present invention may also include any of a wide variety of agronomically suitable additives, adjuvants, or other ingredients and components which improve or at least do not hinder the beneficial effects of the compositions of the present invention (hereinafter "additives"). Generally accepted additives for agricultural application are periodically listed by the United States Environmental Protection Agency. For example, foliar compositions may contain a surfactant and a spreader present in an amount sufficient to promote wetting, emulsification, even distribution and penetration of the active substances. Spreaders are typically organic alkanes, alkenes or polydimethylsiloxanes which provide a sheeting action of the treatment across the phylloplane. Suitable spreaders include paraffin oils and polyalkyleneoxide polydimethylsiloxanes. Suitable surfactants include anionic, cationic, nonionic, and zwitterionic detergents, amine ethoxylates, alkyl phenol ethoxylates, phosphate esters, PEG, polymerics, polyoxyethylene fatty acid esters, polyoxyethylene fatty diglycerides, sorbitan fatty acid esters, alcohol ethoxylates, sorbitan fatty acid ester ethoxylates, ethoxylated alkylamines, quaternary amines, sorbitan ethoxylate esters, alkyl polysaccharides, block copolymers, random copolymers, trisiloxanes, CHELACTANTS.TM. and blends. Surfactant preference is for polyalkylene oxides, polyalkylene glycols, and alkoxyate-fatty acids. Blends are highly effective such as our organosiloxane/nonionic surfactant SILWET.RTM. Y14242 (Y14242) blend which use is demonstrated in our examples. Preferred commercial

aqueous surfactants include Hampshire LED3A; HAMPOSYL.RTM.; TEEPOL.RTM.; TWEEN.RTM.; TRITON.RTM.; LATRON.TM.; PLURONIC.RTM.; TETRONIC.RTM.; SURFONIC.RTM.; SYNPERONIC.RTM.; ADMOX.RTM.; DAWN.RTM., and the like. Commercial emulsifiers for combination with organic solvent formulations include WITCANOL.RTM., RHODASURF.RTM., TERGITOL.RTM. and TWEEN.RTM.. Commercial spreaders include TEGOPREN.RTM., AGRIMAX.TM., DOW CORNING.RTM. 211, X-77.RTM., SILWET.RTM. and the like. Penetrants such as sodium dodecylsulfate, formamides and lower aliphatic alcohols, may be used. Alkoxylation of an active component or otherwise chemically modifying the active components by incorporating a penetrant substance is useful because formulation without additional surfactant is achieved.

#### Detailed Description Text (131):

Work over the past decades has taken our knowledge of cytochromes P450 from identifying enzymes without function to highly characterized proteins with defined catalytic electron transfer functions. See, C. von Wachenfeldt, et al., Structures of Eukaryotic Cytochrome P450 Enzymes, P. R. Ortiz de Montellano, ed. (1995) CYTOCHROME P450: STRUCTURE, MECHANISM, AND BIOCHEMISTRY (Second Ed.), Plenum Press, New York, pp 183-223 and H. Strobelt, et al., NADPH Cytochrome P450 Reductase and Its Structural and Functional Domains, P. R. Ortiz de Montellano, ed. (1995) CYTOCHROME P450: STRUCTURE, MECHANISM, AND BIOCHEMISTRY (Second Ed.) Plenum Press, New York, pp 225-244. Exploitation of CYP has not previously been reduced to practice in plants, but from investigations of biochemical pathways, it has been known that CYP enzymes are involved in the metabolism of single carbon fragments, abscisic acid, ethylene, gallic acid, cytokinin, lignin, furanocoumarin, anthocyanin, gibberellic acid, limonene, geraniol, nerol, dhurrin, bisbenzylisoquinoline alkaloids, jasmonic acid, phosphonomethylglycine, sulfonylurea, phenylurea, aryloxyphenoxypropionate, metflurazon, sethoxydim, bentazon and insecticides. See, M. Schuler, Critical Reviews in Plant Sciences 15(3): 235-284 (1996). Some compounds which may be metabolized into phytotoxic compounds, might enhance herbicidal action. For example, if activity of a reductant herbicide is targeted, then formulating it with an oxidant such as N-3-nitrophenyl-N'-phenylurea may speed its action. Furthermore, oxidants such as pNBA, 1,4-bis[(2-ethylhexyl)amino]anthraquinone or 1,4-bis(2-methylanilino)anthraquinone may be compatible with a reductant herbicide such as phosphonomethylglycine. Our methods are also appropriate to stimulate enhancement of blooms. Interaction of N-phenylcarbamates with CYP has been shown to induce flowering in asparagus seedlings. See, M. Kusakawa, et al., Z. Naturforsch 50c: 373-379 (1995). The results of our experiments with formamidines support the relationship of CYP to flowering, combinations of oxidants with reductant formamidines showing potential for floricultural product development.

#### CLAIMS:

4. The method according to claim 3, wherein said reductant is selected from the group consisting of hemoglobin, tyrosine, tyrosine ester, tyrosine methylester, tyrosine methylester hydrochloride, tyramine, alanyltyrosine, aminopyrine, phosphonomethyl glycine, salicylates, trans-retinoic acid, carbamate, p-aminobenzoic acid, PEG-25 p-aminobenzoic acid, indole-3-glycerol phosphate, methanol, acetone, phenobarbital, and combinations thereof.

16. The method according to claim 10, wherein said reductant is selected from the group consisting of hemoglobin, tyrosine, tyrosine ester, tyrosine methylester, tyrosine methylester hydrochloride, tyramine, alanyltyrosine, aminopyrine, phosphonomethyl glycine, salicylates, trans-retinoic acid, carbamate, p-aminobenzoic acid, PEG-25 p-aminobenzoic acid, indole-3-glycerol phosphate, methanol, acetone, phenobarbital, and combinations thereof.

21. The method according to claim 10, wherein said oxidant and said reductant are applied in an amount effective to increase the amount of cytochrome P450 in tyrosine methylester hydrochloride, tyramine, alanyltyrosine, aminopyrine, phosphonomethyl glycine, salicylates, trans-retinoic acid, carbamate, p-aminobenzoic acid, PEG-25 p-aminobenzoic acid, indole-3-glycerol phosphate, methanol, acetone, phenobarbital, and combinations thereof.

33. The system according to claim 30, wherein said reductant is selected from the group consisting of hemoglobin, tyrosine, tyrosine ester, tyrosine methylester,

tyrosine methylester hydrochloride, tyramine, alanyltyrosine, aminopyrine, phosphonomethyl glycine, salicylates, trans-retinoic acid, carbamate, p-aminobenzoic acid, PEG-25 p-aminobenzoic acid, indole-3-glycerol phosphate, methanol, acetone, phenobarbital, and combinations thereof.

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L12: Entry 23 of 26

File: USPT

Aug 18, 1998

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group suspended in finegrained form in a liquid phase, and at least 5% by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (9):

It is well known that ammonium sulphate acts synergistically on the biological effect of glyphosate and glufosinate. For instance the patent literature contains many examples of combinations of glyphosate and ammonium sulphate, and in practice the farmer usually adds supplementary ammonium sulphate when diluting the glyphosate for use.

Brief Summary Text (10):

Danish patent application no. 2348/88 describe liquid, aqueous solutions of glyphosate with ethoxylated monoamines as surfactants. The possibility of dissolving additional ammonium sulphate exists, but this will lead to a lowering of the dissolvable quantity of glyphosate. Therefore, the maximum amount of glyphosate in a solution containing 280 g/l ammonium sulphate is approximately 120 g/l.

Brief Summary Text (11):

UK patent application GB 2.233.229 A describes a similar system, the ethoxylated monoamines being replaced by ethoxylated diamines. The typical, aqueous solutions contain 200 g/l ammonium sulphate and 75 g/l of glyphosate as its isopropylammonium salt.

Brief Summary Text (12):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (13):

In European patent application EP 441.764 A1 is mentioned, that alkoxylated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (14):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (15):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkylglycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (16):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (17):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (18):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (20):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (21):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (22):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (23):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (24):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a

salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (25):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (35):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1% corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (38):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded, suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (45):

d) In suspension preparations the amount of suspended solid material in a liquid phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended when the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Detailed Description Text (5):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy (methyl) phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy (methyl) phosphinoyl)-L-homoalanyl-L-alanyl-L-alanine and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Detailed Description Text (12):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being



emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%.

Detailed Description Text (13):

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

Detailed Description Text (14):

To produce the herbicidal solution/suspension for use, the farmer may make use of the additive, too. He just has to mix it with a glyphosate- or a glufosinate preparation. The form of the herbicide is of minor importance in this connection, for instance a finely grinded powder, a solid granulate, a solution in an appropriate solvent or even a suspension may be used.

Detailed Description Text (26):

Preferred herbicidal compositions are such, in which the selected herbicide is glyphosate or glufosinate, and the selected electrolyte is ammonium sulphate.

Detailed Description Text (29):

The wording "surfactants" includes emulsifiers, as well as dispersing and wetting agents. A surfactant might be a polymer with a molecular weight of below approximately 15,000 Dalton with many hydrocarbyl- and/or hydrocarbylene groups, or it must always contain at least one hydrocarbyl- or hydrocarbylene group containing at least 8 carbon atoms, or a polymethylenesiloxane with at least 8 silicon atoms. Besides the surfactant must contain at least one hydrophilic group, for example a polyoxyethylene group, an amine group, a sulfonic acid group or a phosphate ester group, but this is no exhaustive characterization of a surfactant. Surfactants comprise compounds described in sales brochures relating to emulsifiers, dispersing and wetting agents and in catalogues and works of reference for such. As examples of works of reference McCutcheon's publications: "Detergent & Emulsifiers International Edition" and "North American Edition", Glen Rock, N.J. 07452, USA are to be mentioned.

Detailed Description Text (38):

The cationic surfactants may be selected from the group comprising C.sub.8-30 -hydrocarbylamine and C.sub.8-30 -hydrocarbyl-di- and triamine being alkoxyated with min. 1 preferably min. 2, especially min. 5 and specially min. 8 oxyethylene and/or oxypropylene groups; quaternary amines with min. one C.sub.8-30 -hydrocarbyl and/or hydrocarbylene group and their alkoxyated derivatives; and amine modified polymethylsiloxanes.

Detailed Description Text (44):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of ammonium sulphate to known products, and they are known to possess a particularly satisfying biological effect, it seems redundant to prove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Detailed Description Text (52):

The compositions of the invention might comprise hygroscopic compounds, possibly

also acting to stabilize pH and selected from the group consisting of hydroxycarboxylic acids, di- and tricarboxylic acids and their hydroxy acids, said acids being present as free acids and having a solubility in water at 20.degree. C. of at least 1% by weight. Examples of such acids are lactic acid, oxalic acid, succinic acid, tartaric and citric acid. The amount of these acids in the composition may be approximately 0.1-22%, preferably 0.4-16%, especially 1-11% and specially 2-7%.

Detailed Description Text (61):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Detailed Description Text (66):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (69):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (70):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirconium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (71):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by Attagel, and the grinding was continued for approximately 5 minutes.

Detailed Description Text (73):

Samples of the above compositions were stored in 100 ml glass bottles with screw caps for 1 to approximately 4 weeks before the beginning of the accelerated testing. It was initially evaluated, whether the sample had separated a clear aqueous phase, and whether the surfactant had separated out on its own. The results of all evaluations are listed in table A. Subsequently the sample was shaken. The viscosity was visually evaluated, and the average particle size of the grinded glyphosate particles was estimated microscopically at 256 x. (It is very difficult to use a particle sizer for so many samples, because the samples must be measured in concentrated salt solutions possibly further saturated with glyphosate, in order to ensure, that the samples are not dissolved in the water. It is also important that the concentrated salt solution does not contain undissolved impurities, which might disturb the measurements). It was also estimated, whether the added surfactants had separated out as oily drops. If so, the estimated size of the drops was noted. If no oily drops could be observed, a "n.d." (not detected) is stated in the table. It should be noted, that any microscopic airbubbles present may give rise to a false positive result.

Detailed Description Text (85):

After this testing period both groups of samples were cooled to ambient temperature and evaluated as mentioned above. Supplementary the speed of dissolution was determined as follows: 1 ml suspension was pipetted off and placed in a 150 ml beaker containing 100 ml deionized water. The mixture was stirred on a magnetic stirrer of moderate speed using a 4 cm magnet so as to produce an approximately 1 cm deep vortex in the diluent water, and the period of time until no more undissolved glyphosate could be observed was measured in seconds. All observations are listed in table A.

Detailed Description Text (100):

Experiments 6-10, 11-15, 16-20, 21-25 and 26-29 in the tables B, C, D, E, and F describe glyphosate compositions comprising various surfactants in varying amounts. The ratio glyphosate/surfactant is about 2/1 corresponding to the usual ratio in most commercial products. The amount of finely distributed fillers varies from 0 to 2% by weight. In all of the experiments the amount of the electrolyte ammonium sulphate is varying from app. 20 to 27 by weight. The grinding is performed in a mini-mill as described for the samples 3-5 in table A, the sulfuric acid addition, however, being omitted.

Detailed Description Text (106):

Experiments 31-35, 36-40, 41-45 and 46-49 in the tables G, H, I and J relate to various glyphosate compositions. Experiments 31-33 (table G) relate to compositions with ammonium salts different from ammonium sulphate. Experiments 34 and 35 (table G) relates to compositions comprising herbicide only suspended in an electrolyte solution. Experiments 36-40 (table H) show the use of potassium thiocyanate, sodium bromide and ammonium acetate as electrolyte. In the experiments 36 and 37, one of the acid groups in glyphosate is transformed into the sodium salt. In experiment 38, a little amount only of glyphosate is transformed into the sodium salt. In experiments 39 and 40, one of the acid groups in glyphosate is transformed into its ammonium salt. The experiments 41-45 (table I) relate to compositions comprising viscosity regulating, hygroscopic compounds. These are glycerine, propylene glycol, polyethylene glycol and lactic acid. Obviously the addition of these to the aqueous phase caused no tendency to separation of undissolved electrolyte. Experiments 46 and 47 relate to compositions further comprising oil. Experiment 48 and 49 relate to compositions comprising herbicide suspended in an electrolyte solution and small amounts of a viscosity regulating filler, but no surfactant.

Detailed Description Text (111):

In the experiments 46 and 47, the oils apparently do not disperse onto the grinded glyphosate, unlike the surfactants. This conclusion is based partly on the microscopy and partly on the experiment 46, in which the sample, which had been stored at varying temperatures, at the end of the experiment had separated two upper, clear phases. This was not observed in experiment 47. In both samples, the oil was uniformly re-distributed in the compositions after shaking.

Detailed Description Text (123):

The actual surfactant of the French example 1, a derivative of an ethoxylated fatty amine, is not commercially available, and is synthesized from ethylene oxide (extremely poisonous). Experiments 57 and 58 are intended to show, that compounds being comparable to this surfactant do not solubilize the ammonium sulphate. Consequently the amount of dissolved ammonium sulphate in example 1 in FR 2.663.315 can not exceed 5% w/w. Genamin S 25 is the most ethoxylated of the commercially available ethoxylated fatty amines. In experiment 57 Genamin S 25 is admixed with propylene glycol, before the mixture is added to the ammonium sulphate solution. PEG 400 is polyethylene glycol comprising on an average 8 moles of ethylene glycol. Since this compound does not comprise any hydrophobic group, it is more hydrophilic than ethoxylated fatty amines, and therefore probably has a greater impact on the solubility of ammonium sulphate. In experiment 58 PEG 400 is admixed with the propylene glycol, before the mixture is added to the ammonium sulphate solution. Both example 57 and 58 show a precipitation of ammonium sulphate following the addition of the propylene glycol mixtures to the aqueous ammonium sulphate solutions.

The product of example 60 has been produced by initially dissolving the ammonium sulphate in water (40% ammonium sulphate solution) followed by admixture of propylene glycol, leading to a precipitation of ammonium sulphate. The stirring on the mini-mill was started, and the glyphosate was added in the usual way followed by admixture of Genapol OX-130.

At normal temperatures an ammonium sulphate solution comprises approximately 40% ammonium sulphate. In experiment 61 20 g ammonium sulphate was dissolved in the water phase followed by addition of propylene glycol, causing a precipitation of ammonium sulphate. Another 20 g ammonium sulphate was finely grinded in a blender with a view to adding it slowly during grinding before the addition of glyphosate, before the addition of Genapol and after the addition of Genapol, respectively.

A preferred composition of glyphosate in electrolyte solution comprises the following:

169.1 g glyphosate

169.1 g glyphosate is dissolved in 266 g water and 80 g aqueous 25% w/w ammonia solution together with 159,4 g ammonium sulphate in a beaker and is transferred to another container under vigorous stirring.

## TABLE A

Experiment no.	1	2	3	4	5
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Components	Composition in % Deionized water	41.6	41.1	41.0	41.0	40.8	Ammonium sulphate	27.8	27.4	27.4	27.4	27.2	Glyphosate,	98%	20.8	20.6	20.6	20.6	20.4	Genamin T 150 (1)	6.9	6.8	Genamin O 80 (2)	6.8	Genamin C 100 (3)	6.8	Genamin C 020 (4)	6.8																								
Sulfuric acid, 98% app.	1.5 app.	1.4	2.1	2.1	2.7	Attagel (5)	1.4	2.7	2.1	2.1	2.1	Total weight (g)	144	146	146	146	147	Density (g/ml)	1.30	1.29	1.28	1.28	1.25	Glyphosate (g/l)	270	266	264	264	255	Ammonium sulphate	361	353	351	351	340 (g/l)																	
Evaluation before storage	Appearance	15% upp.	10% upp.	10% upp.	10% upp.	10% upp.	10% upp.	10% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly slightly pseudo- pseudo- plastic viscous viscous plastic plastic Particle size (.mu.m) app.	10 app.	10	5-10 app.	10	5-10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	Evaluation after storage at various temperatures	Appearance	30% upp.	20% upp.	15% upp.	25% upp.	25% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily suffici-	suffici-	easily	easily	ently	ently	Particle size (.mu.m) app.	10	10-15 app.	10	10-15	5-10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	4	6	3	3	2
Evaluation after storage 14 days at 55.degree. C.	Appearance	15% upp.	5% upp.	10% upp.	10% inner	15% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly pseudo- pseudo- pseudo- plastic viscous plastic plastic Particle size (.mu.m) app.	10	10-15 app.	10	10-15	app.	10	10-15	app.	10	10-15	app.	10	10-15	app.	10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	3	4	4	2	7																		

## TABLE B

Experiment no.	6	7	8	9	10
----------------	---	---	---	---	----

											Component						
Composition in % Deionized water											40.5	40.5	40.5	40.5	40.5	Ammonium sulphate	27.0
27.0	27.0	27.0	27.0	27.0	Glyphosate, 98%	20.3	20.3	20.3	20.3	20.3	Ethoquad C/25 (6)	10.2					
Emcol CC 55 (7)	10.2	Ampholyt SKKP-70 (8)	10.2	Synperonic NP-10 (9)	10.2	Tween 20 (10)	10.2	Attagel (5)	2.0	2.0	2.0	2.0					
2.0	2.0	2.0	2.0	2.0	Total weight (g)	148	148	148	148	148							
Density (g/ml)	1.28	1.27	1.27	1.27	1.27	Glyphosate (g/l)	260	258	258	258	258						
Ammonium sulphate	346	343	343	343	343	(g/l)	Evaluation before storage										
se-	no se-	15% lower	15% lower	10% lower	paration	paration	cl.	phase	cl.	phase	cl.						
phase	viscosity	slightly	easily	slightly	slightly	slightly	slightly	viscous	viscous	viscous	viscous						
viscous	Particle size (.mu.m)	app.	10	app.	10	10-15	10-15	10	Oil drops (.mu.m)	n.d.							

Experiment no.	21	22	23	24	25
----------------	----	----	----	----	----

														Component
Composition in % Deionized water														27.0
27.6	26.7	25.8	25.5	Glyphosate, 98%	20.3	20.7	20.0	19.4	19.1	Berol OX 45-11	(21)			
10.2	10.3	13.3	16.1	15.9 Attagel (5)	2.0	1.3	Total weight (g)	148	145	150	155	157		
Density (g/ml) 1.26 1.26 1.26 1.25 1.25 Glyphosate (g/l) 256 261 252 243 239														
Ammonium sulphate 340 348 337 323 319 (g/l) Evaluation before storage Appearance no														
se-	15%	lower	15%	lower	15%	lower	10%	lower	paration	cl.	phase	cl.	phase	cl.
cl.	phase	Viscosity	pseudo-	easily	easily	easily	slightly	plastic	viscous	Particle				
size (.mu.m) app. 15 10-15 app. 15 10-15 app. 10 Oil drops (.mu.m) <25 25-100 <25														
25-100 25-100 Evaluation after storage at various temperatures Appearance 5% upp.														
35%	upp.	30%	inner	20%	lower	5%	inner	cl.	phase	cl.	phase	cl.	phase	cl.
phase	Viscosity	clearly	very	ea-	easily	suffici-	pseudo-	pseudo-	sily	ently	plastic			
plastic Particle size (.mu.m) 10-15 10-15 10-15 10-15 app. 10 Oil drops (.mu.m) <25														
n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	3	2	2	2	3	Evaluation after storage	14	days		
at 55.degree. C. Appearance no se- 30% upp. 15% inner 15% lower 10% lower paration														
cl.	phase	cl.	phase	cl.	phase	cl.	phase	Viscosity	clearly	very	ea-	easily	suffici-	
pseudo- pseudo- sily ently plastic plastic Particle size (.mu.m) 10-15 10-15 app. 15														
10-15	10-15	Oil drops (.mu.m)	<25	n.d.	25-100	n.d.	25-100	Speed of dissol. (s)	10	1				
1	2	3												

## Detailed Description Paragraph Table (6):

TABLE F

Experiment no. 26 27 28 29 30

														Component
Composition in % Deionized water														27.2
27.0	27.3	20.3	27.0	Glyphosate, 98%	20.4	20.3	20.5	20.3	20.3	Marlipal 1618/25	(22)			
10.2	Radiasurf 7417	(23)	10.2	Berol OX 45-11	(21)	10.3	10.2	Berol 533	(24)	10.2				
Aerosil R 972 (20) 1.0 Attagel (5) 1.4 2.0 2.0 2.1 Total weight (g) 147 148 146.5														
148	148	Density (g/ml)	1.27	1.28	1.26	1.22	1.26	Glyphosate (g/l)	345	346	258	248	256	
Ammonium sulphate 259 260 344 248 340 (g/l) Evaluation before storage Appearance no														
se-	no	se-	no	se-	no	se-	no	se-	no	se-	no	se-	no	
se-	no	se-	no	se-	no	se-	no	se-	no	se-	no	se-	no	
Viscosity slightly slightly pseudo- pseudo- pseudo- viscous viscous plastic plastic														
plastic Particle size (.mu.m) app. 15 app. 15 app. 10 app. 15 app. 15 Oil drops														
(.mu.m)	n.d.	25-100	25-100	25-100	>25	Evaluation after storage at various								
temperatures Appearance 10% upp. 15% upp. 30% upp. 30% upp. 15% upp. cl. phase cl.														
phase	cl.	phase	cl.	phase	cl.	phase	Viscosity	clearly	pseudo-	pseudo-	pseudo-			
suffici-	pseudo-	plastic	plastic	plastic	plastic	ently	plastic	Particle size (.mu.m)	10-15					
app. 10	app. 10	10-15	app. 10	Oil drops (.mu.un)	n.d.	n.d.	25-100	n.d.	n.d.	Speed of				
dissol. (s)	2	2	2	2	3	Evaluation after storage	14	days	at 55.degree. C.	Appearance				
no se- no se- no se- 20% upp. no se- paration paration paration cl. phase paration														
Viscosity slightly pseudo- pseudo- easily viscous* viscous plastic plastic Particle														
size (.mu.m)	10-15	app. 10	app. 10	app. 15	app. 10	Oil drops (.mu.m)	n.d.	n.d.	n.d.					
n.d.	n.d.	Speed of dissol. (s)	7	3	2	2	17							

\*Screw

cap leaky, crystals from the liquid observed.

## Detailed Description Paragraph Table (7):

TABLE G

Experiment no. 31 32 33 34 35

														Component
Composition in % Deionized water														41.1
17.0	Ammonium sulphate	17.0	24.6	22.1	Ammonium nitrate	27.0	Glyphosate, 98%	20.5						
20.4	20.3	38.5	44.8	Berol OX 45-11	(21)	10.3	10.2	10.2	Attagel (5)	0.7	1.4	2.0	Total	
weight (g) 146 147 148 130 145 Density (g/ml) 1.35 1.29 1.25 1.33 1.38 Glyphosate														
(g/l)	277	263	254	512	618	Electrolyte (g/l)	555	439	338	327	305	Evaluation before		
storage Appearance 10% lower no se- no se- 20% upp. 10% upp. cl. phase paration														
paration	cl.	phase	cl.	phase	Viscosity	easily	slightly	easily	passende	slightly				
viscous viscous viscous Particle size (.mu.m) app. 15 10-15 10-15 20-25 app. 20 Oil														
drops (.mu.m)	25-100	25-100	25-100	25-100	n.d.	n.d.	Evaluation after storage at various							
temperatures Appearance 25% lower 10% upp. 30% upp. 30% upp. 20% upp. cl. phase cl.														
phase	cl.	phase	cl.	phase	cl.	phase	Viscosity	easily	pseudo-	easily	passende			
slightly	plastic	viscous	viscous	viscous	viscous	Particle size (.mu.m)	app. 15	10-15	10-15	25-30				
app. 20	Oil drops (.mu.m)	<25	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	2	3	2	32	12		
Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower no se- 30%														
upp.	30%	upp.	15%	upp.	cl.	phase	paration	cl.	phase	cl.	phase	cl.	phase	Viscosity

easily pseudo- easily easily slightly plastic viscous Particle size (.mu.m) app. 15  
10-15 app. 15 app. 25 app. 20 Oil drops (.mu.m) n.d. n.d. 25-100 n.d. n.d. Speed of  
dissol. (s) 3 5 2 16 6

#### Detailed Description Paragraph Table (8):

TABLE H

Experiment no. 36 37 38 39 40

										Component
Composition in % Deionized water	27.0	23.7	37.8	27.6	26.3	Kalium thiocyanate	42.1			
Ammonium sulfamate	40.5	39.5	Natrium bromide	29.7	Ammonium acetate	33.8	Glyphosate,			
98% 20.3	Glyphosate Na-salt	20.3	23.0	Glyphosate NH.sub.4 -salt	27.6	23.0	Berol OX			
45-11 (21)	10.2	9.9	10.1	9.2	Marlipal 1618/25 (22)	9.9	NaOH, 28%	1.4	Attagel (5)	
1.3	0.7	1.8	1.3	Total weight (g)	148	152	148	163	152	
1.35	1.35	Glyphosate salt (g/l)	270	285	282	373	310	Electrolyte (g/l)	539	
456	533	Evaluation before storage	Appearance	10% lower	5% lower	10% inner	no se-	no		
se-	cl.	phase	cl.	phase	cl.	phase	paration	paration	Viscosity	
easily pseudo-	clearly plastic	ently plastic	pseuplas.	Particle size (.mu.m)	app. 15					
10-15	10-15	30-50	app. 15	Oil drops (.mu.m)	n.d.	<25	n.d.	n.d.	25-100	
				Evaluation						
after storage at various temperatures	Appearance	10% lower	10% lower	25% upp.	no se-					
10% lower	cl.	phase	cl.	phase	cl.	phase	paration	cl.	phase	
suffici-	easily clearly	clearly	pseuplas.	ently pseuplas.	pseuplas.	Particle size				
(.mu.m)	20-25	app. 15	10-15	app. 50	app. 20	Oil drops (.mu.m)	n.d.	n.d.	n.d.	
n.d.	Speed of dissol. (s)	3	5	3	9	2	Evaluation after storage	14	days at 55.degree.	
C.	Appearance	10% lower	10% lower	20% upp.	no se-	no se-	cl.	phase	cl.	
phase	paration	paration	Viscosity	clearly	suffici-	easily clearly	clearly	pseuplas.		
ently pseuplas.	pseuplas.	Particle size (.mu.m)	15-20	10-15	app. 15	30-50	app. 15			
Oil drops (.mu.m)	n.d.	n.d.	n.d.	<25	n.d.	Speed of dissol. (s)	7	8	5	

#### Detailed Description Paragraph Table (9):

TABLE I

Experiment no. 41 42 43 44 45

										Component
Composition in % Deionized water	38.0	38.0	13.6	38.0	22.1	Ammonium sulfamate	20.5			
32.2	Ammonium sulphate	25.3	25.3	25.3	Glyphosate, 98%	19.0	19.0	20.6	19.0	
OX 45-11 (21)	9.5	9.5	10.3	9.5	Glycerine	6.3	34.3	Propylene glycol	20.7	
(27)	6.3	Lactic acid	6.3	Attagel (5)	1.9	1.9	0.7	1.9	Total weight (g)	
158	140	Density (g/ml)	1.27	1.25	1.30	1.27	1.34	Glyphosate (g/l)	241	
238	268	241	335	Electrolyt (g/l)	321	316	267	321	431	
Evaluation before storage	Appearance	no se-	no							
se-	no se-	no se-	20% upp.	paration	paration	paration	paration	cl.	phase	
pseudo-	pseudo-	pseudo-	clearly easily plastic	plastic	plastic	pseudo-	plastic			
Particle size (.mu.m)	app. 15	app. 10	app. 15	app. 15	app. 10	Oil drops (.mu.m)				
25-100	>100	n.d.	25-100	n.d.	Evaluation after storage at various temperatures					
Appearance	no se-	10% upp.	10% lower	5% upp.	35% upp.	paration	cl.	phase	cl.	
cl.	phase	cl.	phase	Viscosity	pseudo-	pseudo-	pseudo-	clearly easily plastic	plastic	
plastic pseudo-	plastic	Particle size (.mu.m)	10-15	app. 10	app. 15	app. 15	app. 10			
Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	2	2	4	
after storage 14 days at 55.degree.	C.	Appearance	no se-	no se-	no se-	no se-	25%			
upp.	paration	paration	paration	cl.	phase	Viscosity	clearly pseudo-	pseudo-		
clearly easily pseudo-	plastic	plastic	pseudo-	plastic	plastic	Particle size (.mu.m)				
app. 15	5-10	app. 15	app. 15	app. 10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	
Speed of dissol. (s)	8	2	5	2	3					

#### Detailed Description Paragraph Table (10):

TABLE J

Experiment no. 46 47 48 49

										Component
Composition in % Deionized water	38.0	38.0	40.5	57.6	Ammonium sulphate	25.3	25.3	27.0	14.3	
Glyphosate, 98%	19.0	19.0								
30.5	25.2	Berol 02 (13)	6.3	6.3	Hydropar 19 (25)	9.5	Radia 7131 (26)	9.5	Attagel 1.9	
1.9	2.0	2.9	Total weight (g)	158	158	148	139	Density (g/ml)	1.22	
1.21	1.34	1.22	Glyphosate (g/l)	232	230	409	174	Ammonium sulphate	309	
306	362	307	(g/l)	Evaluation						
before storage	Appearance	10% lower	15% lower	no se-	10% upp.	cl.	phase	cl.	phase	
paration	cl.	phase	Viscosity	suffici-	suffici-	pseudo-	easily ently	ently plastic		
Particle size (.mu.m)	app. 20	app. 15	10-15	20-25	Oil drops (.mu.m)	>100	25-100	n.d.		



n.d. Evaluation after storage at various temperatures Appearance 30% 2 30% lower 10%  
 upp. 10% upp. upp. cl. cl. phase cl. phase cl. phase phases Viscosity suffici-  
 pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 10-15  
 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 2 2 2 22  
 Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower 20% lower no  
 se- no se- cl. phase cl. phase paration paration Viscosity suffici- pseudo- pseudo-  
 easily ently plastic plastic Particle size (.mu.m) app. 15 app. 15 10-15 20-25 Oil  
 drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 4 5 2 4

#### Detailed Description Paragraph Table (11):

TABLE K Experiment no. 50 51  
 Component Composition in % Deionized water  
 42.8 41.7 Ammonium sulphate 28.6 27.8 Moussex 904 SE (28) 0.7 Ethoquad C/25 (6) 25.0  
 Berol OX 45-11 (21) 27.8 Attagel 40 (5) 3.6 2.0 Total weight (g) 140 144 Density  
 (g/ml) 1.15 1.14 Glyphosate (g/l) -- -- Ammonium sulphate 329 317 (g/l) Evaluation  
 before storage Appearance 10% lower 10% lower cl. phase cl. phase Viscosity suffici-  
 suffici- ently ently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100  
 Evaluation after storage at various temperatures Appearance 30% lower 25% lower cl.  
 phase cl. phase Viscosity suffici- suffici- ently ently Particle size (.mu.m) -- --  
 Oil drops (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C.  
 Appearance 10% lower 5% lower cl. phase cl. phase Viscosity suffici- suffici- ently  
 ently Particle size (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

#### Detailed Description Paragraph Table (14):

TABLE N Experiment no. 59 60 61 62 Component  
 Composition in g Deionized water 60.0 30.0  
 30.0 Ammonium sulphate 40.0 20.0 40.0 40.0 Propylene glycol 30.0 30.0 60.0  
 Glyphosate, 98% 30.0 30.0 30.0 30.0 Genapol OX 130 (30) 20.0 20.0 20.0 20.0  
 Viscosity Brook- 1800 3100 -- -- field at 20.degree. C. mPaxs mPaxs

#### Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, 88928t "Herbicide  
glyphosate salt concentrate", Aug. 30, 1993.

#### CLAIMS:

5. The herbicide composition according to claim 1, wherein the herbicide is  
glyphosate (N-(phosphonomethyl)glycin), glufosinate  
 (4-(hydroxy (methyl)phosphinoyl)-DL-homoalanin,  
 bilanafos (4-hydroxy (methyl)-phosphinoyl)-L-homoalanyl-L-alanyl-L-alanin) and/or  
 glyphosine (N,N-bis(phosphonomethyl)-glycin).

7. The herbicide composition according to claim 1, wherein the herbicide is  
glyphosate, glufosinate, bilanafos and/or glyphosine in its free, non-neutralized  
 form or completely or partly converted into its respective ammonium salt by reaction  
 with ammonia.



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Jun 11, 1996

TITLE: Seed hull extract assimilation agents for agrochemical compositions

[illegible]

## CLAIMS: ,

2. A composition in claim 1 wherein said active ingredient is selected from the group consisting of at least one of the gibberillins; sodium ortho-nitrophenolate; sodium para-nitrophenolate; sodium 5-nitro-guaicolate; a growth stunting amount of mepiquat chloride; a lethal amount of either glyphosate or sulfosate; and a sulfonyl-urea herbicide.

10. A method as in claim 6 wherein the applying step comprises applying said assimilation agent and a plant growth regulating agent comprising an active ingredient selected from the group consisting of at least one of the gibberillins; sodium orthonitrophenolate; sodium para-nitrophenolate; sodium 5-nitro-guaicolate; a growth stunting amount of mepiquat chloride; a lethal amount of either glyphosate or sulfosate.

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L12: Entry 25 of 26

File: USPT

Jul 3, 1979

DOCUMENT-IDENTIFIER: US 4159901 A

TITLE: Corrosion inhibited agricultural compositions

Abstract Text (1):

Corrosion of metal surfaces contacted by aqueous agricultural compositions containing as an active ingredient an aminomethylenephosphonic acid, such as N-phosphonomethylglycine or an agriculturally acceptable salt or ester thereof is inhibited by the inclusion in the compositions of an inhibiting amount of a thiol compound or salt thereof.

Brief Summary Text (4):

The term "active agricultural ingredient" as herein employed is inclusive of any ingredient functioning as a plant phytotoxicant or as a plant growth regulant. The particular function of an active ingredient can be that of a herbicide when applied to the plant at moderate to high application rates and, on the other hand, function as a plant growth regulant at low to minute application rates. Such dual function capability is exhibited by some of the aminomethylenephosphonic acids and their agriculturally acceptable salts as described in U.S. Pat. Nos. 3,455,675 and 3,556,762, the former being directed to phytotoxicant use and the latter to plant growth regulation. The herbicidal activity of N-phosphonomethylglycine and its agriculturally acceptable salt and ester derivatives is described in U.S. Pat. Nos. 3,799,758; 3,868,407; 3,971,648 and 3,977,860. Plant growth regulant utility for N-phosphonomethylglycine and its agriculturally acceptable salt and ester derivatives is described in U.S. Pat. Nos. 3,853,530 and 3,988,142.

Brief Summary Text (5):

The aqueous formulations of the aminomethylenephosphonic acids, such as N-phosphonomethylglycine or derivatives thereof, and more particularly those formulations water-diluted to application levels are corrosive to iron, steel or galvanized metal surfaces of containers in which the concentrates or mixtures are stored, and to steel or galvanized surfaces of spraying equipment. Hydrogen evolution is one aspect of the corrosion activity and can cause disruptive pressures in closed containers containing the aqueous agricultural compositions as well as constituting a fire hazard and explosion hazard.

Brief Summary Text (8):

It was thus most surprising to discover that thiol compounds, e.g. mercaptans, as well as the ammonium and alkali metal thio salts of inorganic polybasic acids and the thio alkali metal salts are effective inhibitors of metal corrosion for aqueous agricultural compositions containing as an active agricultural ingredient an aminomethylenephosphonic acid, such as N-phosphonomethylglycine or the agriculturally acceptable salt or ester derivatives thereof. Obviously, a satisfactory inhibitor of acidic corrosion as measured by H.sub.2 evolution and metal corrosion rate for a herbicidal composition or plant growth regulant composition should not deleteriously modify the agricultural activity of the composition. It was found that both retention of agricultural activity and adequate inhibition of acidic corrosion was obtained by the addition to aqueous formulations of an aminomethylenephosphonic acid or the agriculturally acceptable derivatives of relatively small amounts of certain thio compounds, such as the alkane thiols and dithiols, alkali metal salts of the alkane thiols and dithiols, and the ammonium and alkali metal thio salts of polybasic inorganic acids, i.e., sulfuric acid and phosphoric acid. Adequate inhibition of acidic corrosion as measured by H.sub.2

evolution can be obtained with a minimum of about 0.15 percent by weight of the thio compound on the weight of N-phosphonomethylglycine. To insure long term corrosion inhibition, it is preferred to use the thio compound in amounts of 0.3 to 3 percent by weight on the weight of the N-phosphonomethylglycine or aminomethylenephosphonic acid or derivatives thereof although the thio compound can be employed in amounts as high as 20 percent by weight based on the N-phosphonomethylglycine. Not too infrequently, aqueous concentrates of the herbicidal or plant growth regulant compositions may be stored in the vendor's metal containers by the farmer for many months before being used and, hence, it is desirable to minimize corrosion of the container to the maximum extent in order to prevent any possible leakage of the concentrate due to rusting of the container's metal walls. Amounts more than 5 percent by weight of the thio compound can be used if desired but no further commensurate advantage with respect to corrosion is usually realized.

Brief Summary Text (9):

In the agricultural formulations of this invention, one can employ anionic, cationic or non-ionic surface-active agents. The surfactants which are useful in the compositions of this invention include those of the cationic, anionic, and non-ionic variety and also amine oxide, imidazolines, propoxylated ethoxylated ethylenediamine, quaternary ammonium compounds, betaine derivatives as well as amphoteric surfactants. Examples of the amine oxides are lauryldimethylamine oxide, cetyldimethylamine oxide, myristyldimethylamine oxide, bis(2-hydroxyethyl)cocoamine oxide and the like. Examples of quaternary amine surfactants are cocotrimethylammonium chloride, alkylamidoethyl alkyl imidazolium methyl methosulfate. Examples of cationic surfactants are N,N-bis(2-hydroxyethyl)alkylamines where the alkyl groups are C.sub.14 -C.sub.18 derived from tallow, N,N-bis(.alpha.-ethyl-omega-hydroxy)-poly(oxyethylene)alkylamines having an average of 3 oxyethylene groups, the alkyl being C.sub.14 -C.sub.18 derived from tallow and (3-lauramidopropyl) trimethylammonium methyl sulfate. Some anionic surface-active agents are the sulfated fatty alcohols and the alkylarylsulfonates. Representative of the sulfated fatty alcohols are the sodium or lower alkanol amine salts of the monoesters of sulfuric acid with N-aliphatic alcohols containing from 8 to 18 carbon atoms. The alkylarylsulfonates are inclusive of the products derived from the alkylation of an aromatic hydrocarbon, e.g., benzene, naphthalene, diphenyl, diphenyl methane and phenoxybenzene, sulfonation of the resulting alkylated aromatic hydrocarbon and neutralization of the sulfonation product with NaOH or KOH, or with a primary or secondary amine.

Brief Summary Text (17):

Water-diluted concentrates prepared as described supra and containing the monoisopropylamine salt of N-phosphonomethylglycine as the active agricultural ingredient were modified by the inclusion of various thiol compounds and surfactants as stated in subsequent Table I. Test data reported in Table I was obtained at room temperature.

Brief Summary Text (20):

Experiment 11 involved a herbicidal formulation containing in addition to the dodecanethiol inhibitor, the copresence of oxalic acid in an amount equal to the weight of the isopropylamine salt of N-phosphonomethylglycine. The use of oxalic acid in herbicidal formulations containing N-phosphonomethylglycine or its derivatives is disclosed in "Research Disclosure" publication number RD15334, published January, 1977 by Industrial Opportunities Ltd., Homewell-Havant-Hampshire PO9 1EF, United Kingdom. According to said publication, when herbicidal formulations containing N-phosphonomethylglycine or its derivatives are diluted for application purposes with hard water, i.e. water containing calcium or magnesium ions in the range of from 100 to 2000 or more parts by weight per million parts by weight of water, the diluted formulations have diminished herbicidal activity as compared to the same formulations diluted with deionized water. The publication teaches the use of oxalic acid in hard water diluted herbicidal formulations to restore the herbicidal activity and recommends the amount of oxalic acid be at least equivalent to 50 percent of the calcium or magnesium ion to as much as 200 percent or more of such ions present in the diluting hard water. The weight ratio of the N-phosphonomethylglycine compound to oxalic acid ranges from 1 to 10 parts by weight of the glycine compound per 1 to 10 parts by weight of oxalic acid. Oxalic acid is

known to be corrosive of iron surfaces. As demonstrated by the data in Table I for Experiment 11, the normal corrosive action of oxalic acid on iron surfaces is satisfactorily inhibited when a thiol compound is present in the herbicidal formulation.

Brief Summary Text (21):

That the use of thio compounds as inhibitors of metal corrosion in herbicidal compositions containing an amine salt of N-phosphonomethylglycine does not significantly diminish post-emergent herbicidal activity of the composition is quite evident from the data presented in Table II on the post-emergence killing of quackgrass using formulations described in Table I, being Experiments 1 to 6 and 16 to 18. The experimental formulations were suitably diluted with water and applied to quackgrass plants established from vegetative propagules at a rate of 187 liters per hectare. Plants treated with the experimental formulations were placed in a greenhouse as observed and recorded 12 days after treatment with the herbicidal formulation.

Brief Summary Text (22):

In order to determine that effect on post-emergence herbicidal activity would result when the quantity of thiol inhibitor in a herbicidal formulation containing the monoisopropylamine salt of N-phosphonomethylglycine as the active ingredient was increased many fold beyond that required for adequate inhibition of hydrogen evolution and metal corrosion, two control formulations were prepared, one containing previously described surfactant "A" and the other surfactant "C" according to the following formula, all parts being by weight:

Brief Summary Text (25):

Although the inhibitor efficacy of various thio compounds was exemplified with the monoisopropylamine salt of N-phosphonomethylglycine in Table I, substantially similar corrosion inhibition can be expected when a thio compound as herein disclosed is admixed with other salts and esters of N-phosphonomethylglycine such as the alkali metal salts as are disclosed in U.S. Pat. No. 3,977,860. Such salts and esters include but are not limited to the following: monocyclohexylamine salt of N-phosphonomethylglycine di(methylamine) salt of N-phosphonomethylglycine di(dimethylamine) salt of N-phosphonomethylglycine di(ethylamine) salt of N-phosphonomethylglycine di(n-propylamine) salt of N-phosphonomethylglycine di(morpholine) salt of N-phosphonomethylglycine mono(stearlyamine) salt of N-phosphonomethylglycine mono(tallowamine) salt of N-phosphonomethylglycine mono(methylbutyl) salt of N-phosphonomethylglycine mono(butylamine) salt of N-phosphonomethylglycine n-dibutylamine salt of N-phosphonomethylglycine n-octadecylamine salt of N-phosphonomethylglycine methoxyethylamine salt of N-phosphonomethylglycine ethylenediamine salt of N-phosphonomethylglycine dipropanolamine salt of N-phosphonomethylglycine chloroethylamine salt of N-phosphonomethylglycine phenoxyethylamine salt of N-phosphonomethylglycine mono(triethylamine) salt of N-phosphonomethylglycine mono(diethylenetriamine) salt of N-phosphonomethylglycine monoisopropylamine salt of N-phosphonomethylglycine monomorpholine salt of N-phosphonomethylglycine monoaniline salt of N-phosphonomethylglycine monoethanolamine salt of N-phosphonomethylglycine monodiethanolamine salt of N-phosphonomethylglycine monoammonium salt of N-phosphonomethylglycine monosodium salt of N-phosphonomethylglycine disodium salt of N-phosphonomethylglycine trisodium salt of N-phosphonomethylglycine monopotassium salt of N-phosphonomethylglycine dipotassium salt of N-phosphonomethylglycine tripotassium salt of N-phosphonomethylglycine dilithium salt of N-phosphonomethylglycine

Brief Summary Text (45):

Data on hydrogen evolution and corrosion inhibition by dodecanethiol for several agricultural formulations containing as an active ingredient N-phosphonomethylglycine or salt or ester derivature thereof or an aminophosphonate compound are tabulated in Table IV. The formulations used in Table IV were of two types, liquid and dry powder. Experiments 34 and 35 were conducted on liquid formulations of the following compositions, all parts being by weight:

Brief Summary Text (49):

Experiments 34, 36, 38, 40, 42 and 44 were control experiments containing no

inhibitor. Experiments 37, 39, 41, 43 and 45 were dry solid formulations containing a complex of urea and dodecanethiol. Alkane thiols such as dodecanethiol are substantially water insoluble and although a surfactant is an aid in effecting dispersion of the thiol in an aqueous formulation, it has been found that a solid complex of urea and a straight chain alkane thiol when mixed with a dry mixture of the active ingredient and surfactant enhances dispersibility of the thiol in aqueous agricultural formulations and minimizes separation of the thiol component. The complex dissolves readily in water to reform the urea and the thiol with the thiol being finely dispersed and remaining in suspension. The urea-thiol complex is prepared by dissolving the alkane thiol in a solvent such as isooctane and mixing the solution at room temperature with sufficient urea prewetted with methanol until the urea increases in volume; the reaction is slightly exothermic. The molar ratio of urea to alkane thiol used to form the complex is proportional to the thiol's chain length being at least 6:1 for alkane thiols containing 6 carbon atoms, 10:1 moles for dodecanethiol and about 16:1 for thiols of 16 carbon atoms. The solvents used in the reaction are removed by washing and drying. The corrosion experiments reported in Table IV were all conducted with the liquid as well as the solid type formulations having been diluted with water in amount corresponding to normal application dilutions, namely a dilution that would apply per hectare 2.24 kilograms of active ingredient (calculated as N-phosphonomethylglycine or 2,2'-bisphosphonomethyliminoacetic acid) at a spraying rate of 187 liters per hectare.

#### Brief Summary Text (50):

Thiols other than the alkane thiols have also been found effective in inhibiting corrosion by aqueous agricultural compositions as herein contemplated. Such thiols include the aromatic and cycloaliphatic thiols. For example, 2% inhibiting amounts of p-chlorothiophenol, 2-aminothiophenol, 2-furanomethanethiol, toluenethiol, 2-benzoxazolthiol and mercaptobenzothiazole enable a dry disodium salt of N-phosphonomethylglycine formulation corresponding to Experiment 36 when diluted with water reduces the hydrogen evolution and the metal corrosion rate. Similar corrosion inhibition was obtained when fertilizer diluent ingredients other than urea were included in the agricultural formulations, as, for example, monoammonium phosphate and disodium phosphate.

#### Brief Summary Paragraph Table (1):

N-phosphonomethylglycine Surfactant 15 parts Inhibitor 1 part Water 43 parts  
Monoisopropylamine salt 41 parts of

#### Brief Summary Paragraph Table (2):

Table I

H.sub.2 Evolution cc During Surf- Weight % Solu- Initial 24 Hours per Corrosion Rate  
Expt. ac- Inhibitor tion Metal Surface (929 sq/cm) (mm/year) # tant\* in  
"Concentrate" Inhibitor pH Steel Zinc Steel Zinc

										1 A - no				
inhibitor	4.5	15.0	2.3	0.080	0.037	2	B - no inhibitor	4.3	12.4	2.3	0.091	0.049	3	C -
no inhibitor	4.3	18.0	1.4	0.218	0.068	4	A + 1% 1-dodecanethiol	4.5	0	0	0.011	0.026	5	
B + 1% 1-dodecanethiol	4.3	0	0	0.013	0.006	6	C + 1% 1-dodecanethiol	4.3	0	0	0.017			
0.008	7	C + 1% 1-hexadecylthiol	0	0	0.011	0.025	8	C + 1% 1-octanethiol	0	0	0.017			
0.030	9	C + 1% 1,12-dodecanedithiol	0	0	0.006	0.013	10	C + 1% sodium salt of						
dodecanethiol	0	0	0.010	0.027	11	C + 1% dodecanethiol &	0	0	0.020	0.045	oxalic acid			
equal to weight of isopropyl-														
amine salt of N- <u>phosphonomethylglycine</u>	12	C + 1%												
dodecanesulfide	0.6	0	0.035	0.040	13	C + 1% dodecanedisulfide	1.9	0	0.033	0.053	14	C		
+ 1% octanesulfide	1.1	0	0.022	0.045	15	C + 1% octanedisulfide	0.1	0	0.035	0.093	16			
A + 2% ammonium thiosulfate	0	0	0.040	0.033	17	B + 2% ammonium thiosulfate	0.3	0.3						
0.111	0.119	18	C + 2% ammonium thiosulfate	0.3	0.3	0.155	0.058	19	C + 1%					
furanomethylthiol	0	3.6	0.058	0.10**	20	C + 1% alpha mercapto-	0	4.1	0.043	0.075**				
toluene	21	C + 1% p-thiocresol	0	0	0.033	0.048	22	C + 1% 1-methyl-1-propane-	0	0.6				
0.040	0.033	thiol	23	C + 1% 2-methyl-1-propane-	0	9.8	0.038	0.040	thiol	24	A + 1%			
sodium thiophosphate	0	6.6	0.022	0.205	25	B + 1% sodium thiophosphate	0.7	5.1	0.071					
0.231	26	C + 1% sodium thiophosphate	3.4	5.8	0.081	0.152	27	A + 1%						
dimethyldithiocarbamic	0	1.8	0.020	0.099	acid sodium salt	28	B + 1% dimethyldithio-							
0	5.1	0.022	0.104	carbamic acid sodium salt	29	C + 1% dimethyldithio-	0	3.4	0.043					
0.093	carbamic acid sodium salt	30	A + 1% sodium thio-	0	0.5	0.022	0.086	carbonate						

31 B + 1% sodium thio- 0.7 2.9 0.055 0.071 carbonate 32 C + 1% sodium thio- 0.7 1.1  
0.068 0.096 carbonate 33 Distilled water (no 0.4 0.3 0.043 0.022 inhibitor)

\*Surfactant "A" is a non-ionic type surfactant comprising an ethoxylated tallow amine having the structure ##STR3## wherein m has an average value of between 15 and 20 and R is alkyl having an average number of carbon atoms of about 17-18.  
Surfactant "B" is an anionic type surfactant comprising a mixture which averages about 80 percent or more by weight of a monoisopropylamine salt of C.sub.10 alkyl phenoxybenzene disulfonic acid and up to about 20 percent by weight of dialkylated products of phenoxybenzene disulfonic acid. ##STR4## \*\*Weight gain.

Brief Summary Paragraph Table (3):

Table II	% Inhibition Plant Response (%)
Quackgrass Experiment Rate 12 Days After Number	Surfactant Inhibitor (kg/h) *
Treatment)	1 A None 1.12 95 0.56 95 0.28 40 2
B None 1.12 99 0.56 99 0.28 50 3 C None 1.12 99 0.56 99 0.28 60 4 A Dodecane-	1.12 98 thiol 0.56 98 0.28 45 5 B Dodecane- 1.12 99 thiol 0.56 98 0.28 70 6 C Dodecane-
1.12 99 thiol 0.56 99 0.28 55 16 A Ammonium 1.12 99 thiosul-	fate 0.56 98 0.28 60 17 B Ammonium 1.12 99 thiosul-
fate 0.56 90 0.28 60 18 C Ammonium 1.12 99 thiosul-	fate 0.56 99 0.28 40
*Amount of monoisopropylamine salt of N-phosphonomethylglycine applied pe hectare.	

Brief Summary Paragraph Table (4):

	Monoisopropylamine salt 41 parts of
N-phosphonomethylglycine Surfactant 15	parts Water 44 parts

Brief Summary Paragraph Table (5):

Table III	Formulation Rate % Inhibition
Surfactant Inhibitor (kg/h) * Johnson Grass Quackgrass	
A None 0.28 100 100 A None 0.14 65 98 A None	
0.07 35 25 A None 0.035 0 20 C None 0.28 95 100 C None 0.14 60 95 C None 0.07 30 35	
C None 0.035 0 20 A Octane- 0.28 85 100 thiol A Octane- 0.14 55 65 thiol A Octane-	
0.07 30 15 thiol A Octane- 0.035 0 0 thiol C Octane- 0.28 85 75 thiol C Octane- 0.14	
35 45 thiol C Octane- 0.07 20 30 thiol C Octane- 0.035 0 0 thiol A 1,12-Dode-	
90 100 canedithiol A 1,12-dode- 0.14 60 90 canedithiol A 1,12-dode- 0.07 15 25	
canedithiol A 1,12-dode- 0.035 0 15 canedithiol C 1,12-dode- 0.28 85 100 canedithiol	
C 1,12-dode- 0.14 35 70 canedithiol C 1,12-dode- 0.07 20 40 canedithiol C 1,12-dode-	
0.035 0 20 canedithiol	
*Amount of monoisopropylamine salt of N-phosphonomethylglycine applied he hectare.	

Brief Summary Paragraph Table (6):

	Experiment 34
	Di-(monoisopropylamine) salt of 41
N-phosphonomethylglycine Surfactant "C" 15	Water 44

Brief Summary Paragraph Table (7):

	Experiment 35
	Di-(monoisopropylamine salt of 41
N-phosphonomethylglycine Surfactant "C" 15	Dodecanethiol 1 Water 43

Brief Summary Paragraph Table (14):

	Experiment 42
	N-phosphonomethylglycine 64.4 Surfactant "D"
2 Urea 33.6	

Brief Summary Paragraph Table (15):

	Experiment 43
	N-phosphonomethylglycine 64.4 Surfactant "D"
2 Dodecanethiol - 9.2 Urea Complex (2.1 parts thiol) (7.1 parts urea) Urea 22.4	

CLAIMS:

8. A composition according to claim 1 containing, in addition, between 1 and 10 parts by weight of oxalic acid per 1 to 10 parts by weight of an amine salt of N-phosphonomethylglycine.

10. An composition according to claim 1 wherein the active ingredient is N-phosphonomethylglycine.

12. An composition according to claim 1 wherein the active ingredient is a salt of N-phosphonomethylglycine.

13. An composition according to claim 12 wherein the salt is the monoisopropylamine salt of N-phosphonomethylglycine.

21. A method which comprises contacting a plant with a phytotoxic amount of an aqueous herbicidal composition comprising an amine salt of N-phosphonomethylglycine, a surfactant and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

22. A method according to claim 21 wherein the thio compound constitutes between 0.15 and 3 percent by weight of the amine salt of N-phosphonomethylglycine.

23. A method according to claim 21 wherein the amine salt is the monoisopropylamine salt of N-phosphonomethylglycine.